



Quick Reference Manual

AX-201

Software release - 2.0

PHILIPS

Assembléon
Integrated electronics manufacturing solutions

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Add the order number and revision code of this manual.

This manual is a summary of the reference information and diagrams from

Service Manual AX-201
4022 593 50293
08.03

This manual can be used to check the machine status.

See [A5.1.8 Machine status check](#)

More detailed information can be found in the service manual mentioned above.
Use of this manual for qualified and trained Assembléon engineers only.

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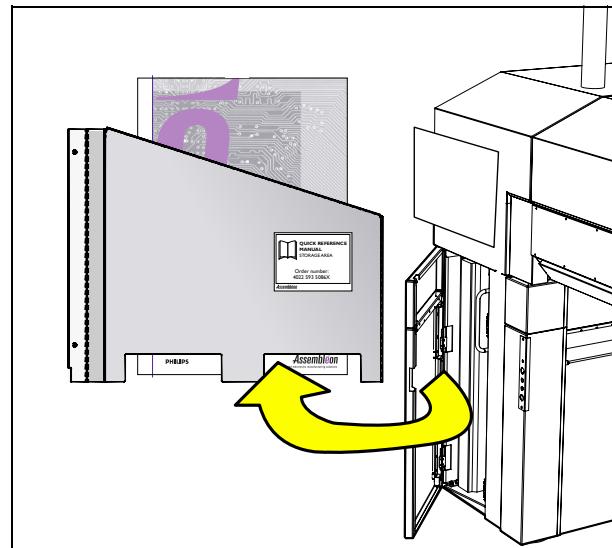
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CHAPTER 1 Location and purpose of this manual

1. Location

- This manual is a part of the machine and must be stored in the storage area in the rear door.



2. Purpose of this manual

- This manual lists all relevant LEDs and fuses in the machine. Some important connections are also highlighted.
- See [A5.1.8 Machine status check](#)

2.1 Tags and abbreviations

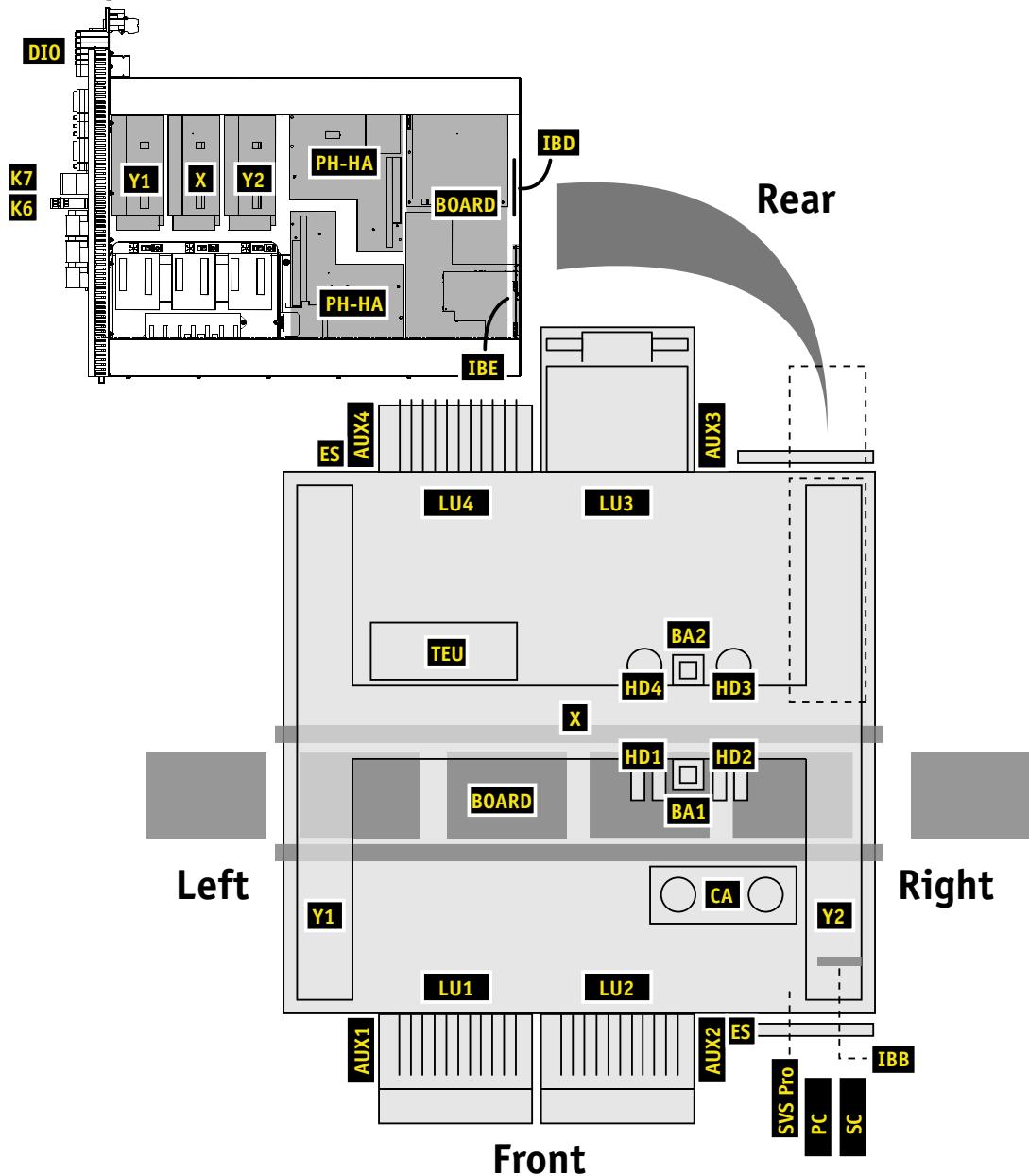


Figure 1 Tags

AUX1.4	Auxiliary feeding connections	IBD	Interconnection board drives
BA	Board alignment camera	K6	Safety relay
BOARD	Board transport	K7	Phase guard relay
CA	Component alignment camera	LU1.4	Trolley lift
DIO	Digital I/O	PC	Process controller
ES	Emergency stop button	PH-HA	Placement head HA controller
HD-1, HD-2	Placement heads HA or DV front	SC	System controller
HD-3, HD-4	Placement heads HA or DV rear	SVS	System verification setup
IBB	Interconnection board base	TEU	Toolbit exchange unit

Figure 2 Tags, abbreviations

CHAPTER A2 Safety

A2.1 General

For the correct and safe use of this machine, it is essential that all personnel should follow the safety procedures specified in this manual.

All manuals have danger, warning and cautionary statements where applicable.

Danger, warning and cautionary statements and / or symbols are present on the machine where applicable.

A2.2 Personnel qualification

Operation, adjustment, maintenance and repair of this machine shall be carried out by **qualified and trained** personnel only.

The following training levels are defined:

- Operator level.
- User or supervisor level.
- Maintenance or service level.



NOTE: For each level an official Assembléon training is available.

A2.3 Basic safety rules

- Do not use the machine in an environment where flammable gasses are present or where it is extremely dirty.
- When any personal protection equipment (PPE) is mentioned, it should be used in accordance with the manufacturers instructions.
- Do not defeat or bridge safety devices, connectors etc.
- Use only Assembléon recommended spares and tools.
- Keep fingers and other body parts outside the machine.

A2.4 Safety compliance

The safety of this machine is based on industry-specific criteria (international codes, regulations, and standards).

Since this machine is designed for operation in a flow line, full mechanical safety in accordance with these criteria is only guaranteed when openings of the run-in and run-out sections are covered by the preceding and succeeding equipment in the flow line.

This machine should not be operated as a stand-alone machine.

A2.5 Danger, warning and caution

■ Danger

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

A danger statement is displayed in this manner:



HAZARD IDENTIFICATION

Hazard consequence.
Hazard avoidance.

■ Warning

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

A warning statement is displayed in this manner:



HAZARD IDENTIFICATION

Hazard consequence.
Hazard avoidance.

■ Caution

Caution indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

A caution statement is displayed in this manner:



HAZARD IDENTIFICATION

Hazard consequence.
Hazard avoidance.

A2.6 Safety stickers

Pictogram	Category	Meaning
	1 Warning	DANGER OF CLAMPING FINGERS Serious injury to fingers. Keep hands away from moving parts.
	2 Warning	DANGER OF STRONG MAGNETIC FIELD Pacemaker and metal prosthetic users are at risk of serious injury or death. Stay away from the magnets.
	3 Warning	DANGER, HIGH VOLTAGE Contact may cause electric shock or burn. Turn off & lock out system before servicing.

Figure 1 Safety stickers

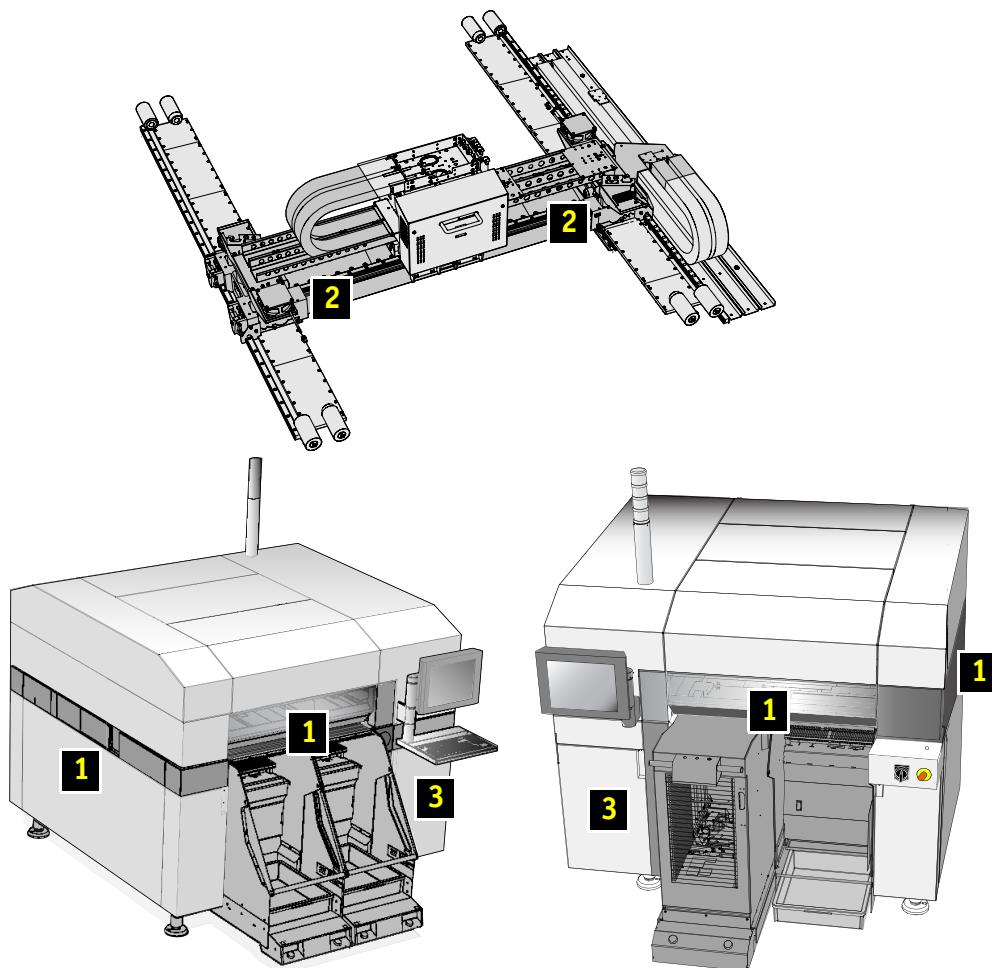


Figure 2 Location of safety stickers

A2.7 Safety devices

	Safety device	Hazard protected	Detection method	Machine condition after safety device is activated
1	Emergency stop button front and rear	Hazardous moving parts.	Safety circuit interruption by pushing the emergency stop button.	All moving parts will be stopped and power to servo systems is turned off.
2	Safety interlock.	Hazardous moving parts.	Safety circuit interruption by opening hood rear.	
3			Safety circuit interruption by opening hood front.	
4			Safety circuit interruption by lowering any trolley.	
5			Safety circuit interruption by removing any trolley lift cover.	
6	"Start on" button. PA 2410/00 only.	Uncontrolled power up	Preventing uncontrolled power up of machine after power failure.	Power to the machine is turned on.
7	Electrical disconnect.	Hazardous voltage.	Mains power supply to the machine interruption by turning the electrical main switch to 'off'.	All power to the machine is turned off.
8	Air disconnect.	Hazardous air pressure.	Main air supply to the machine interruption by turning the main air switch to 'off'.	All air pressure to the machine is turned off, and present air pressure is released safely.
9	Enabling switch front and rear	Hazardous moving parts	Device for running the machine with the front or rear hood opened, when troubleshooting, teaching or servicing. See A2.7.1.Enabling switch front/rear, usage	The XY robot runs at 12.5 % of its normal speed.

Figure 3 Safety devices

Locations of safety devices are depicted in [Figure 4](#) and [Figure 5](#).

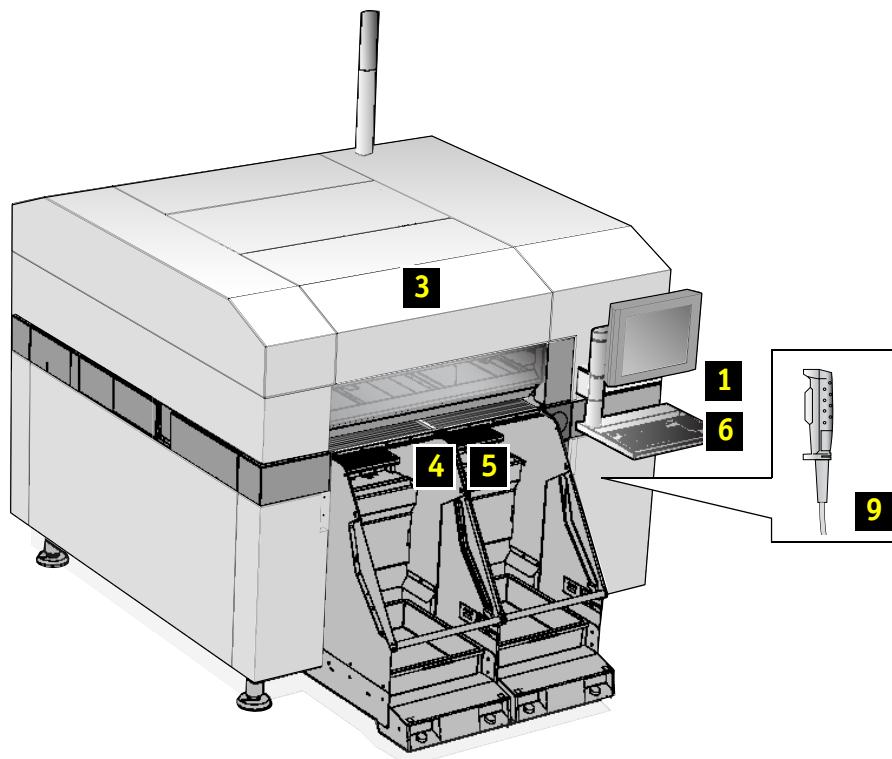


Figure 4 Location of safety devices, front

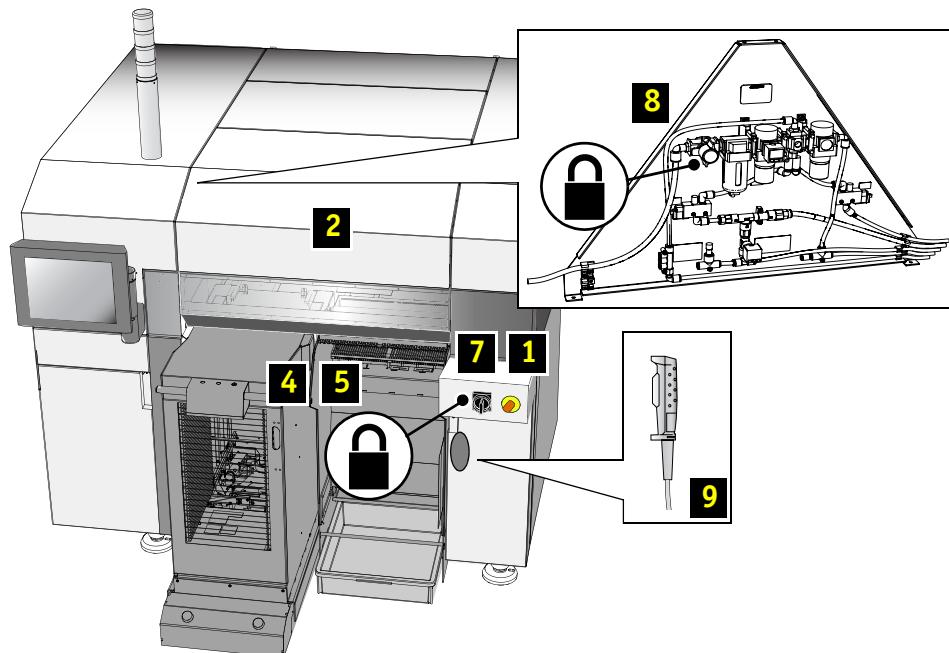


Figure 5 Location of safety devices, rear

Lock the electrical main switch (7) and the air main switch (8) by a padlock to avoid unauthorized use.

A2.7.1 Enabling switch front/rear, usage

⚠ CAUTION

DANGER OF MOVING PARTS

Serious injury to fingers and body parts.

Keep fingers and body parts outside the machine.

Use the enabling switch (1) only as a hold-to-run device to suspend the safety function of the hood (2). Keep fingers and other body parts outside the machine when using the enabling switch (1).

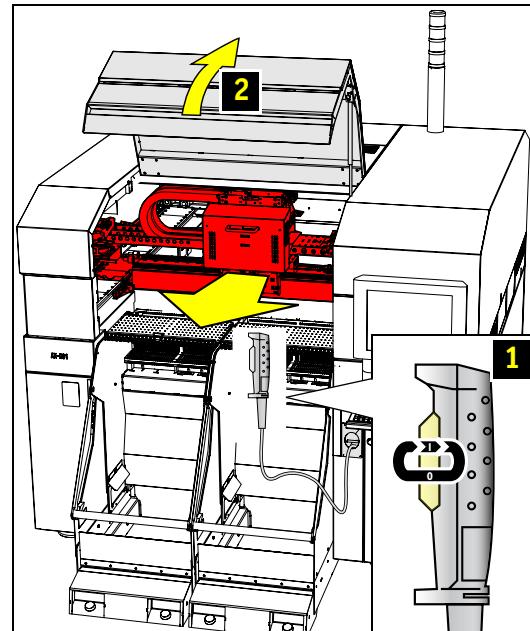
For teaching pick positions or for trouble shooting the machine can be operated with the hood (2) in opened position by using the enabling switch (1).

XY robot operation with open hood (2) is only possible when the enabling switch (1) is held in the middle position.

The XY robot (3) will run at 12.5 % of its normal speed.

Releasing the enabling switch (1) or squeezing the switch blocks further XY robot operation.

Each hood (front/rear) has its own enabling switch (front/rear).



A2.8 Noise levels

Location	Noise level
Sound pressure at operator's position	≤ 72 dB(A)
Average environmental noise level during measurement	≤ 58 dB(A)

Figure 6 Noise levels

A2.9 Emergency contact

In case assistance is needed during an emergency situation, contact the regional Assembléon organization.

Region	Number
Asia	+65-62-61-4611
America's	+1-800-474-4547
Europe	+31-20-5040679

Figure 7 Numbers

A2.10 Liability

Assembléon will not be liable for any costs, damages or personal injuries if the machine is not used according to the safety rules given in this manual.

Instructions written in English are original instructions.

Instructions written in other languages are a translation of the original.

A2.11 Recommended tools for working safely

Description	Picture	Application
1 Stepstool		Useful for smaller persons: reaching inside the machine or closing hoods.
2 Pallet truck		Lifting and moving of heavy modules.
3 Gloves		Skin protection during lubrication.

Figure 8 Recommended tools for working safely

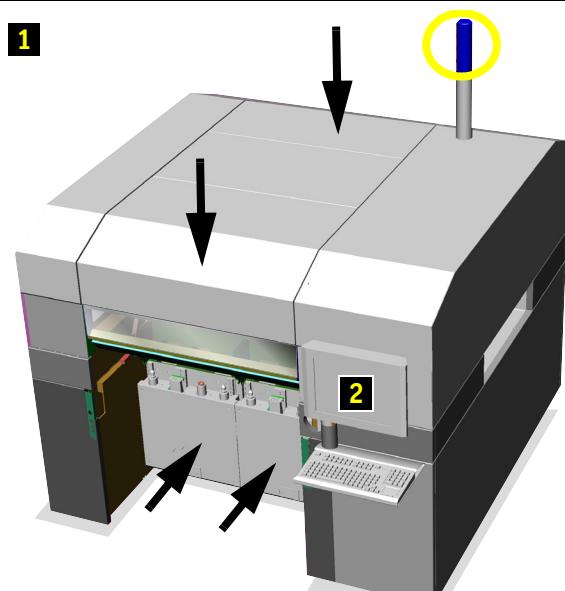
A5.1.8 Machine status check

The machine status can be checked by checking the LEDs.

1. Pre-start actions

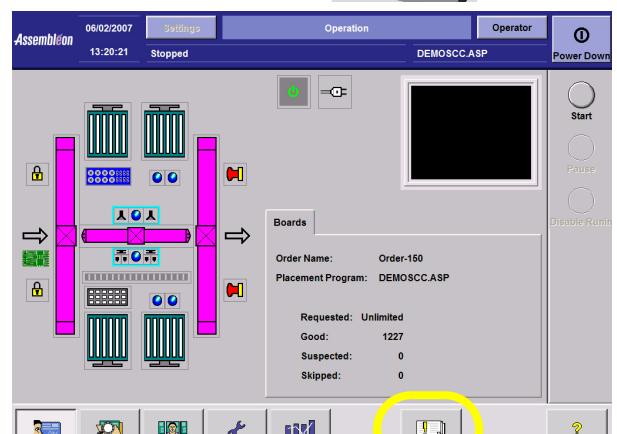
- Close front and rear covers.
- Release both emergency stop buttons.
- Be sure that :
 - * All trolley slots are occupied with trolleys, safety covers or feeder banks.
 - * The machine is powered up and started.
 - * A placement program is loaded.

The machine must be in idle state now: Lamp post: **white**

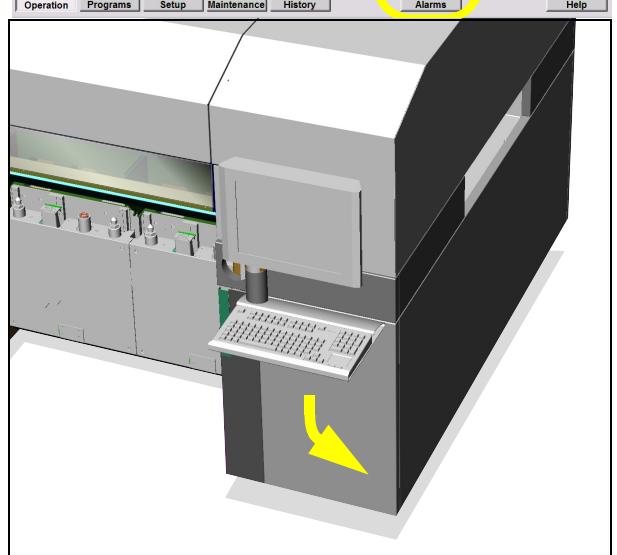


2. Check user interface (2)

- Select 'alarm' to check for warnings and errors.

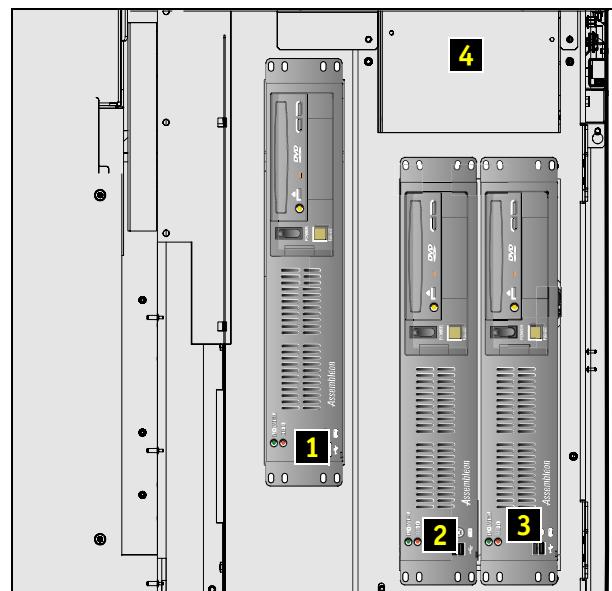


3. Open the front door of the machine

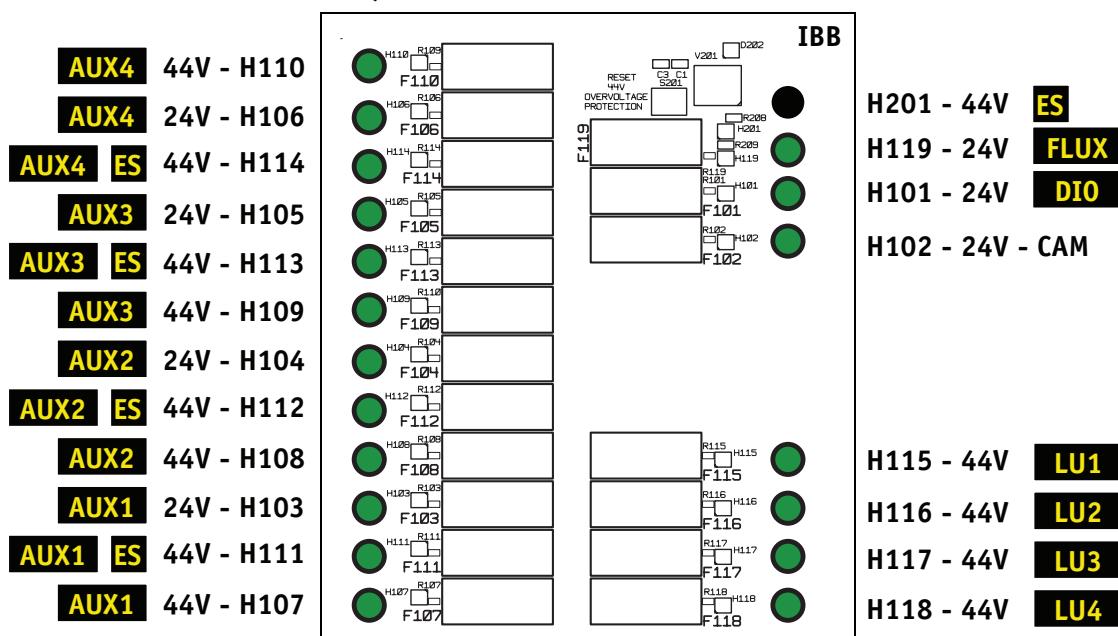


4. PC, SC, SVS Pro controller LEDs

- Check **POWER LED** status of
 - * SVS Pro controller (1, when mounted)
 - * Process controller (2)
 - * System controller (3).
- POWER LEDs must be **ON, GREEN**
- Check LEDs on IBB (interconnection board base) (4), see step 5.



5. IBB (interconnection board base), LEDs

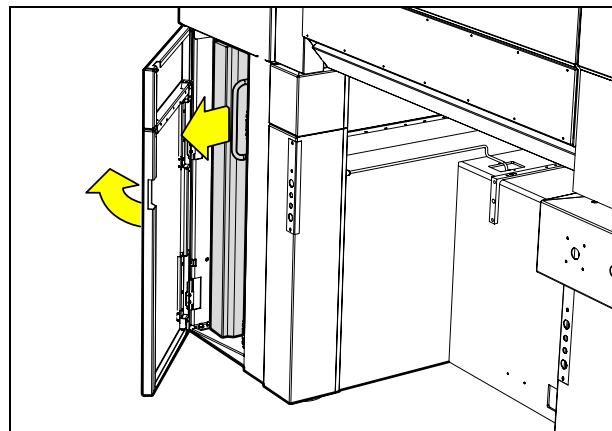


- Leds to be **ON, GREEN**

LED		Fuse
H101	24V - DIO Input/output	4AT
H102	24V - Camera	4AT
H103	24V - Aux. feeding S1	2AT
H104	24V - Aux. feeding S2	2AT
H105	24V - Aux. feeding S3	2AT
H106	24V - Aux. feeding S4	2AT
H107	44V - Aux. feeding S1	2AT
H108	44V - Aux. feeding S2	2AT
H109	44V - Aux. feeding S3	2AT
H110	44V - Aux. feeding S4	2AT
H111	44V - Emergency Stop - Aux. feeding S1	2AT
H112	44V - Emergency Stop - Aux. feeding S2	2AT
H113	44V - Emergency Stop - Aux. feeding S3	2AT
H114	44V - Emergency Stop - Aux. feeding S4	2AT
H115	44V - Trolley lift 1	2AT
H116	44V - Trolley lift 2	2AT
H117	44V - Trolley lift 3	2AT
H118	44V - Trolley lift 4	2AT
H119	24V - Fluxer	4AT
LED to be OFF :		
H201	44V - Over voltage protection	-

6. Open the rear door of the machine

- Pull out the control supply unit.



7. Control supply unit, LEDs

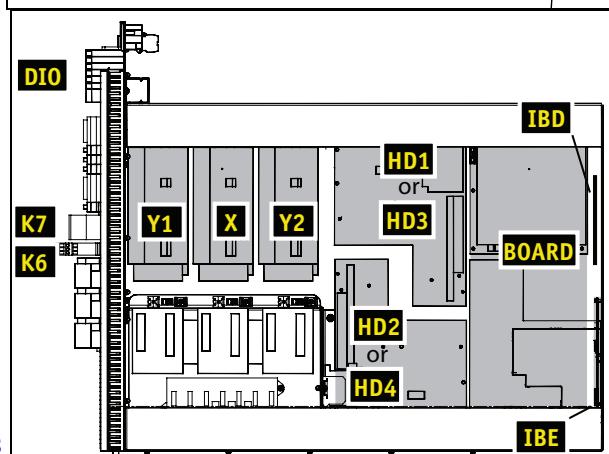
- **DIO** see [8. Digital IO \(DIO\), LEDs](#)
- **K7** see [9. Phase guard relay \(K7\)](#)
- **K6** see [10. Safety relay \(K6\)](#)
- **IBE** see [11. IBE \(interconnection board electrics\)](#)
- **IBD** see [12. IBD \(interconnection board drives\)](#)
- **BOARD** see [14. Transport controller and 13. Transport amplifier](#)
- **X, Y1, Y2** see [16. Motion amplifiers XY robot](#)
- **HD3, HD4*** see [15. Placement head HA controllers](#)

Not shown in picture:

- **HD1, HD2***. see [17. Placement head DV controllers](#)

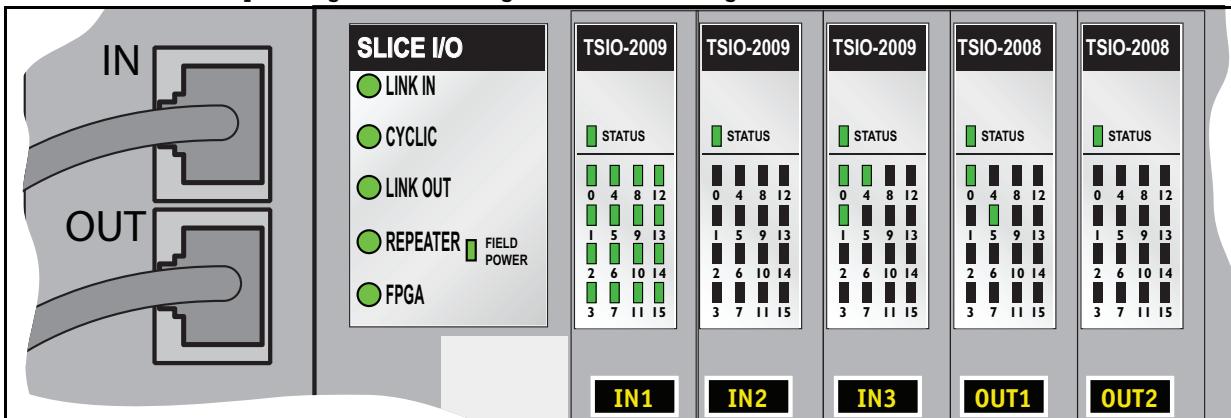
*) Placement heads HA can be located on HD1, HD2 as well.

Placement heads DV can be located on HD3, HD4 as well.



8. Digital IO (DIO), LEDs

Depending on the configuration, there might be differences.



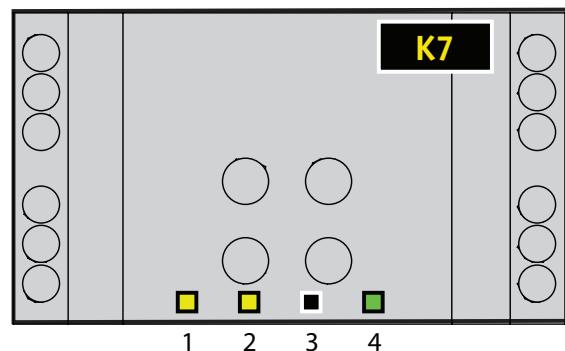
LEDs to be ON, GREEN

Slice I/O	
LINK IN	Synqnet IN from Y2 amplifier
CYCLIC	-
LINK OUT	Synqnet OUT to Y2 placement DV controller
REPEATER	-
FPGA	Field programmable gate array
FIELD POWER	-

Inputs		Outputs	
IN1-0	Compressed Air Level OK	OUT1-0	Lamp White (Idle)
IN1-1	Vacuum Level OK	OUT1-1	Lamp Blue (Error)
IN1-2	Bitbus Nodes OK	OUT1-2	Lamp Green (Running)
IN1-3	Servo Power On	OUT1-3	Audio Beeper
IN1-4	Emergency Stop Front	OUT1-4	Trolley Exchange
IN1-5	Emergency Stop Rear	OUT1-5	Quick Stop Bitbus Nodes
IN1-6	Emergency Stop Cover Open Front left	OUT1-6	Blower CA front , CA rear
IN1-7	Emergency Stop Cover Open Rear left	OUT1-7	-
IN1-8	Feeder Ready Section 1	OUT1-8	Valve 1 (verification tool)
IN1-9	Feeder Ready Section 2	OUT1-9	Valve 2 (verification tool)
IN1-10	Feeder Ready Section 3	OUT1-10	Valve 3 (verification tool)
IN1-11	Feeder Ready Section 4	OUT1-11	Valve 4 (verification tool)
IN1-12	Emergency Stop Trolley Lift 1	OUT1-12	Claim fluxer
IN1-13	Emergency Stop Trolley Lift 2	OUT1-13	-
IN1-14	Emergency Stop Trolley Lift 3	OUT1-14	-
IN1-15	Emergency Stop Trolley Lift 4	OUT1-15	-
Inputs		Outputs	
IN2-0	Input aux. Feeding Front S1-C1-1	OUT2-0	Output aux. Feeding Front S1-C1-1
IN2-1	Input aux. Feeding Front S1-C1-2	OUT2-1	Output aux. Feeding Front S1-C1-2
IN2-2	Input aux. Feeding Front S1-C2-1	OUT2-2	Output aux. Feeding Front S1-C2-1
IN2-3	Input aux. Feeding Front S1-C2-2	OUT2-3	Output aux. Feeding Front S1-C2-2
IN2-4	Input aux. Feeding Front S2-C1-1	OUT2-4	Output aux. Feeding Front S2-C1-1
IN2-5	Input aux. Feeding Front S2-C1-2	OUT2-5	Output aux. Feeding Front S2-C1-2
IN2-6	Input aux. Feeding Front S2-C2-1	OUT2-6	Output aux. Feeding Front S2-C2-1
IN2-7	Input aux. Feeding Front S2-C2-2	OUT2-7	Output aux. Feeding Front S2-C2-2
IN2-8	Input aux. Feeding Rear S3-C1-1	OUT2-8	Output aux. Feeding Rear S3-C1-1
IN2-9	Input aux. Feeding Rear S3-C1-2	OUT2-9	Output aux. Feeding Rear S3-C1-2
IN2-10	Input aux. Feeding Rear S3-C2-1	OUT2-10	Output aux. Feeding Rear S3-C2-1
IN2-11	Input aux. Feeding Rear S3-C2-2	OUT2-11	Output aux. Feeding Rear S3-C2-2
IN2-12	Input aux. Feeding Rear S4-C1-1	OUT2-12	Output aux. Feeding Rear S4-C1-1
IN2-13	Input aux. Feeding Rear S4-C1-2	OUT2-13	Output aux. Feeding Rear S4-C1-2
IN2-14	Input aux. Feeding Rear S4-C2-1	OUT2-14	Output aux. Feeding Rear S4-C2-1
IN2-15	Input aux. Feeding Rear S4-C2-2	OUT2-15	Output aux. Feeding Rear S4-C2-2
Inputs		Outputs	
IN3-0	E-stop Cover Open Front Right		
IN3-1	E-stop Cover Open Rear Right		
IN3-2	E-stop spare		
IN3-3	E-stop External		
IN3-4	No overvoltage (44V)		
IN3-5	E-stop spare +external		
IN3-6	Fluxer ready		
IN3-7	Fluxer cover placed		
IN3-8	-		
IN3-9	-		
IN3-10	-		
IN3-11	-		
IN3-12	-		
IN3-13	-		
IN3-14	-		
IN3-15	-		

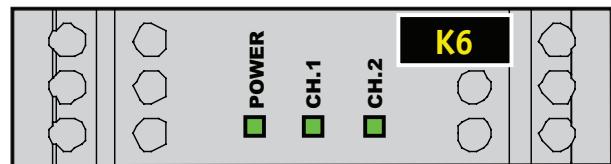
9. Phase guard relay (K7)

	ON
1	Output relay on
2	Output relay on
3	Alarm on: not all 3 phases are present and / or phase sequence is incorrect
4	Power supply on



10. Safety relay (K6)

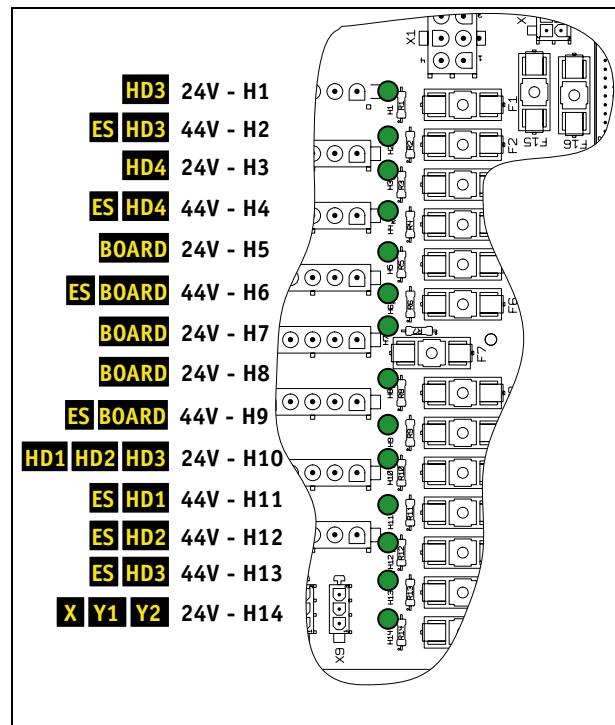
POWER	ON
CH.1	ON
CH.2	ON



11. IBE (interconnection board electrics)

LEDs to be ON, GREEN

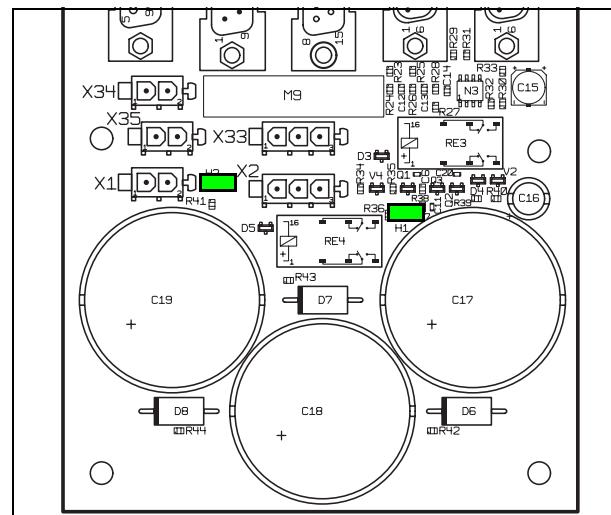
LED		Fuse	Amp.
H1	24V supply PH HA drive 1	F1	4AT
H2	44V-ES supply PH HA drive 1	F2	4AT
H3	24V supply PH HA drive 2	F3	4AT
H4	44V-ES supply PH HA drive 2	F4	4AT
H5	24V supply transport controller	F5	4AT
H6	44V-ES supply transport controller	F6	4AT
H7	24V supply transport controller piggyback	F7	4AT
H8	24V supply transport amplifier	F8	4AT
H9	44V-ES supply transport amplifier	F9	4AT
H10	24V supply head drive 1&2(&3)	F10	4AT
H11	44V-ES supply head drive 1	F11	4AT
H12	44V-ES supply head drive 2	F12	4AT
H13	Spare: 44V-ES supply head drive 3	F13	4AT
H14	24V logic supply Y1+Y2+X	F14	4AT
-	Z-axis PH HA Head 1	F15	4AT
-	Z-axis PH HA Head 2	F16	4AT



12. IBD (interconnection board drives)

LEDs to be **ON, GREEN**

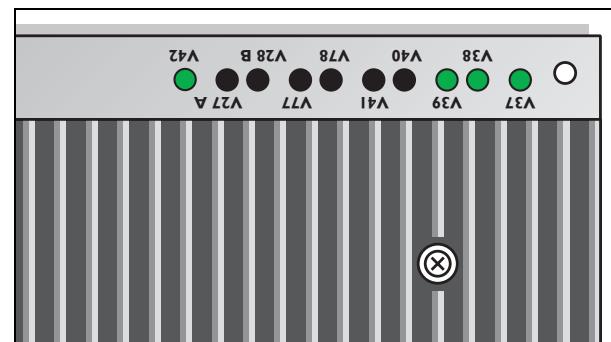
LED	STATUS
H1	Servo power XY robot enabled
H2	Power supply 24V



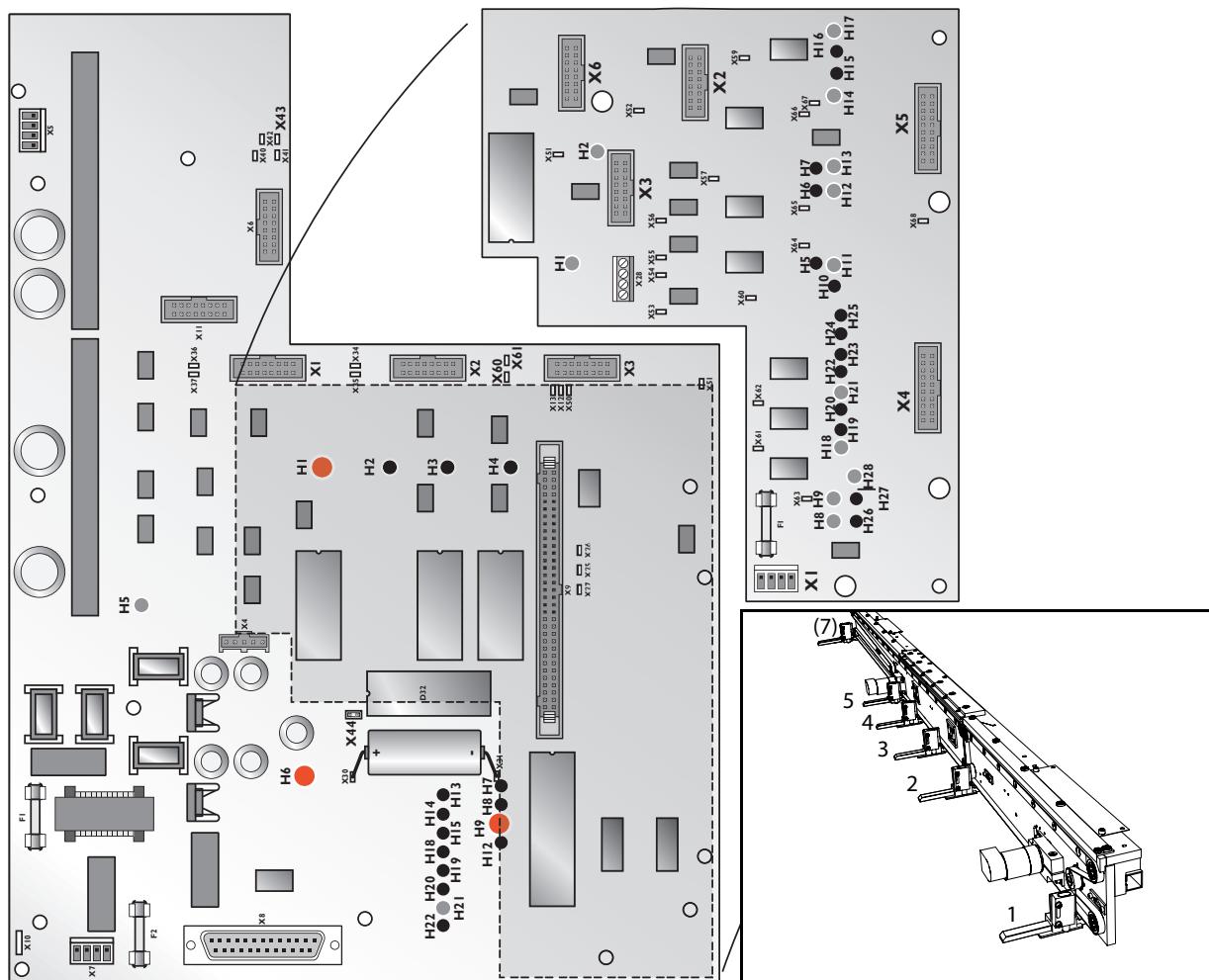
13. Transport amplifier

LEDs to be **ON, GREEN**. Use a mirror.

LED	SYSTEM STATUS
V37	CHOPON (chopper transistor operation)
V38	ENABLE (no error signals)
V39	HSPOK (board in position front)
V42	LSPSOK (low voltage power supply) no error



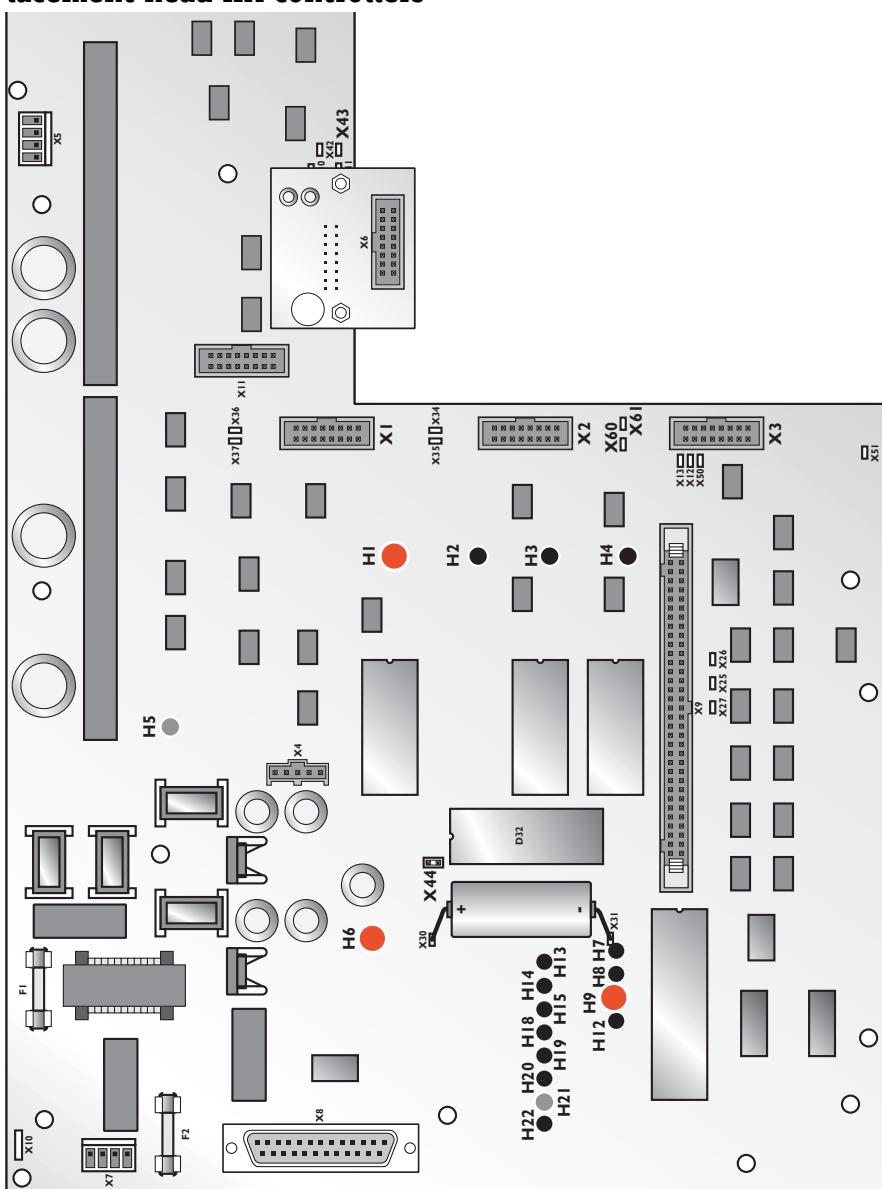
14. Transport controller



LEDs to be ON, RED

LED	SYSTEM STATUS	LED	SYSTEM STATUS
H1	Index WA	H6	Servo power OK (45V)
H2	Index Z-lift	H9	Enable controller
H4	Index RI	H21	Enable amplifier WA and RI
H5	24V supply < 16V (power failure)		
Piggy back			
H1	Enable servo power on	H13	Board sensor, WA-IN (3)
H2	Index Width	H14	Z brake
H7	Board sensor, run-out OUT (7)	H17	SMEMA board available
H8	Board sensor, run-in OUT (2)	H18	SMEMA busy
H9	SMEMA previous machine board available	H21	Width brake
H11	SMEMA next machine busy	H28	Board sensor, run-in IN (1)
H12	Board sensor, WA-POS (5)	No LED	Board sensor, WA-LOW (4)

15. Placement head HA controllers



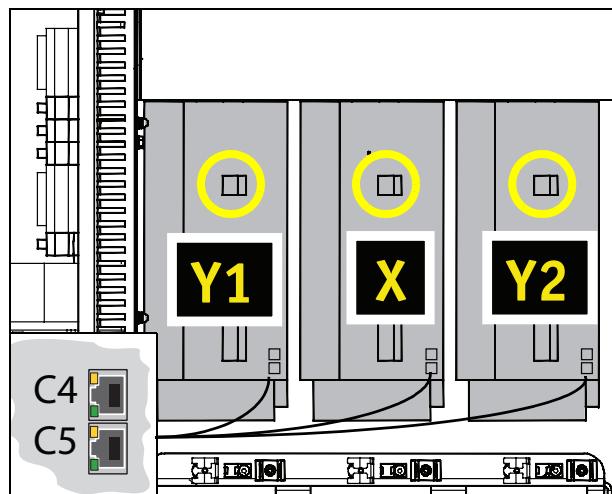
LEDs to be ON, RED

LED	SYSTEM STATUS		
H1		H13	Digital output - Select nozzle/grip
H3	Zero fine RZ encoder	H14	Digital output - Vacuum
H4	Zero fine Z encoder	H15	Digital output - Exchange toolbit
H5	24V supply < 16V (power failure)	H18	Digital output - Select analogue
H6	44V supply > 25V (emergency stop)	H19	Digital output - PC busy
H7	Digital input - RZ EPD, zero coarse Z	H21	Digital output - Emergency head control
H9	Digital input - Enable controllers	H22	Digital output - Enable RZ amplifier

16. Motion amplifiers XY robot

- The display on each motion amplifier must show '2.'
- Synqnet communication on each motion amplifier C4,C5.

All green and orange LEDs must be ON.



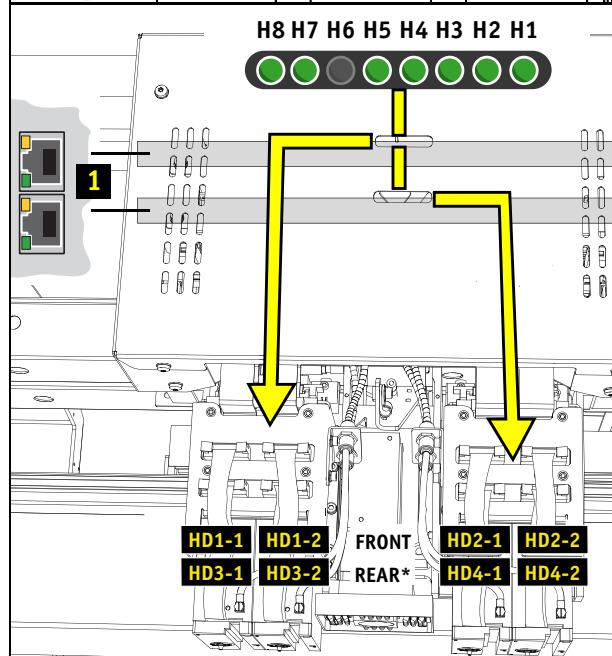
17. Placement head DV controllers

LEDs to be ON, GREEN

LED	CONTROLLER STATUS
H1	Power
H2	Z axis - HDx-1
H3	RZ axis - HDx-1
H4	Z axis - HDx-2
H5	RZ axis - HDx-2
H6	Node alarm
H7	FPGA status
H8	Boot status

* Placement heads DV can be located on HD3, HD4 as well.

- Synqnet communication on each placement head DV controller (1). All green and orange LEDs must be ON.



A5.3 Diagrams

A5.3.1 Wiring diagrams

A5.3.1.1 Wiring diagram PA2410/01

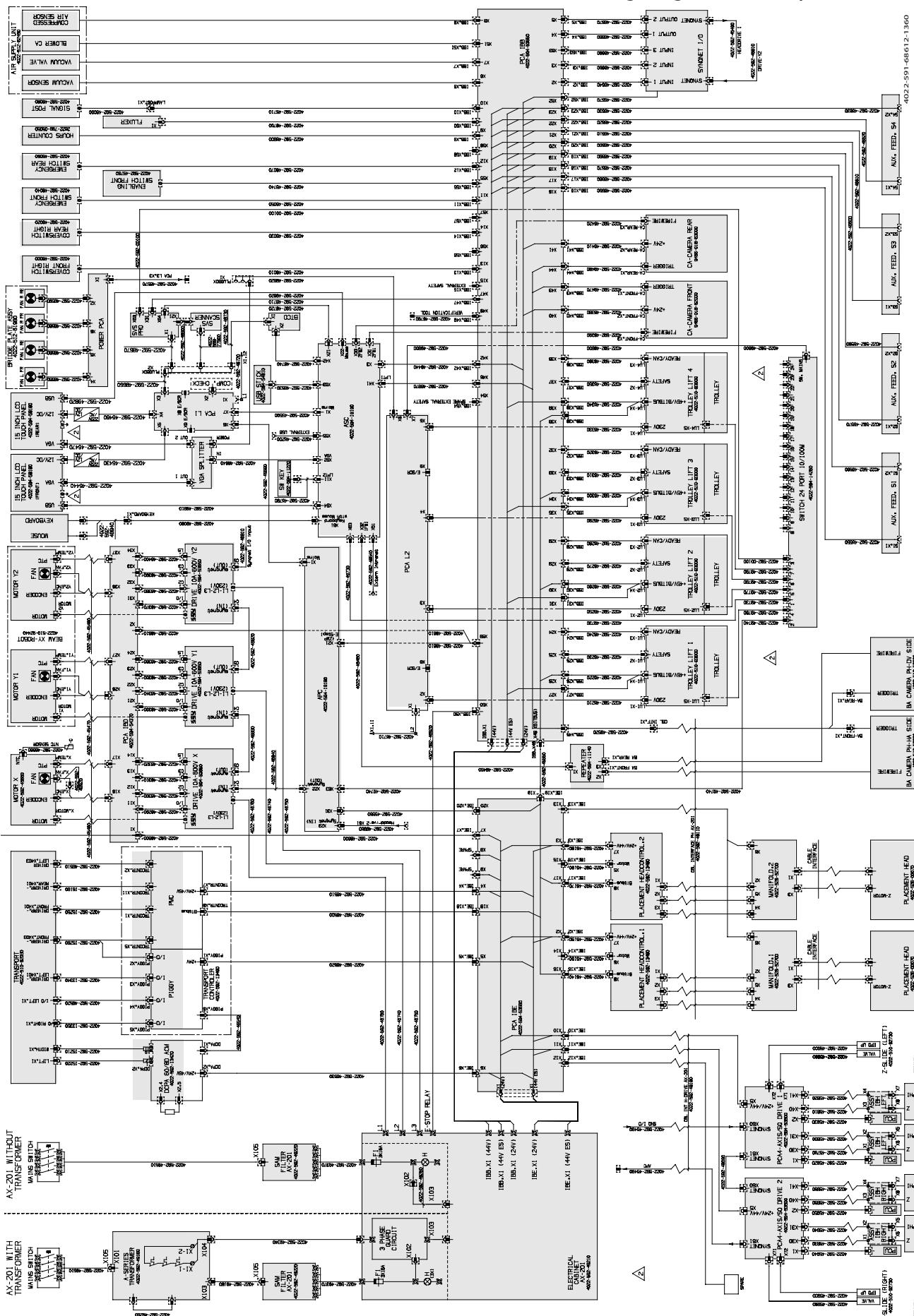


Figure 75 Wiring diagram PA2410/01

A5.3.1.2 Wiring diagram PA2410/00

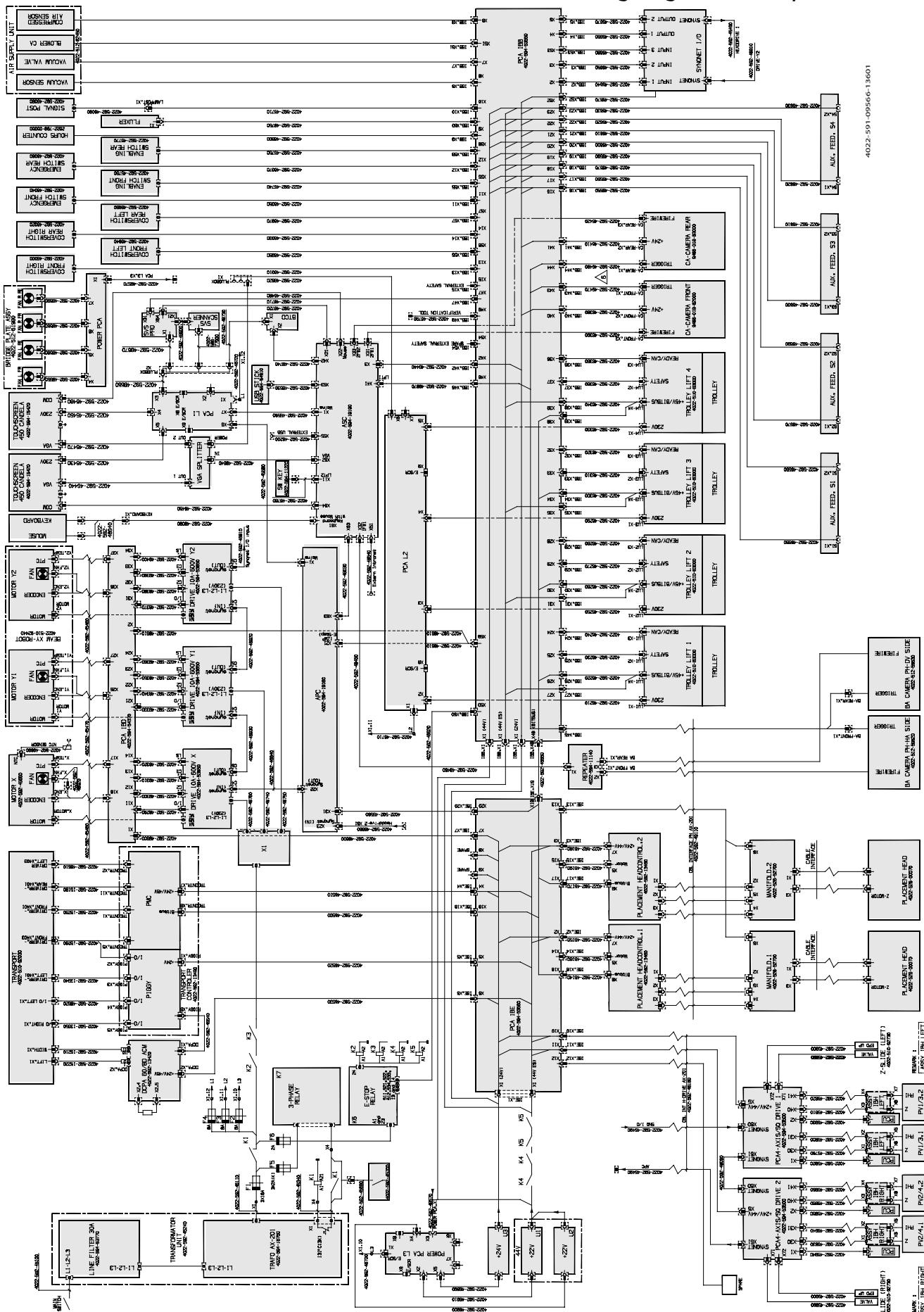


Figure 76 Wiring diagram

A5.3.2 Power and safety circuit

A5.3.2.1 Power and safety circuit, PA 2410/01

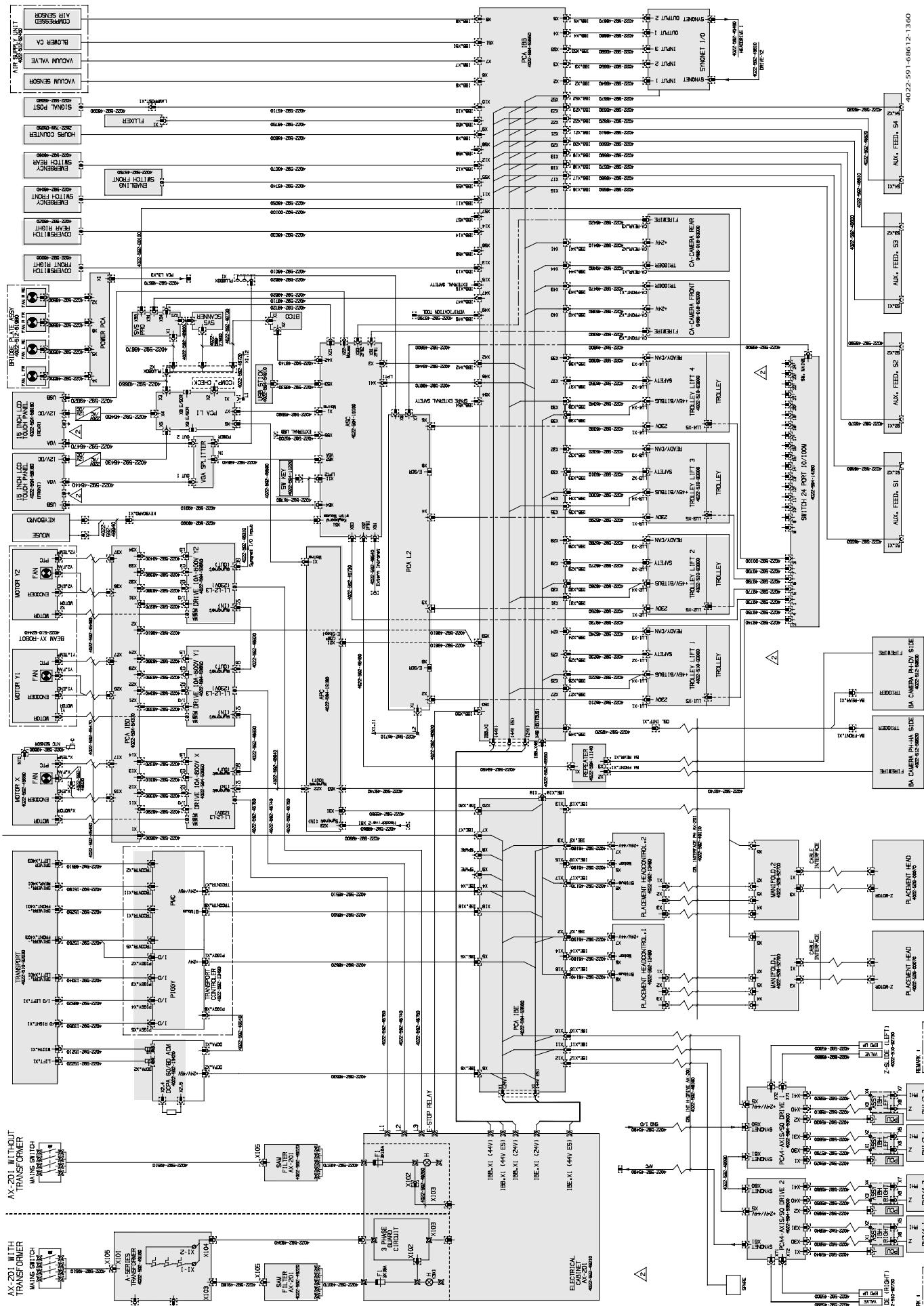


Figure 77 Power and safety circuit, PA 2410/01

A5.3.2.2 Power and safety circuit, PA 2410/00

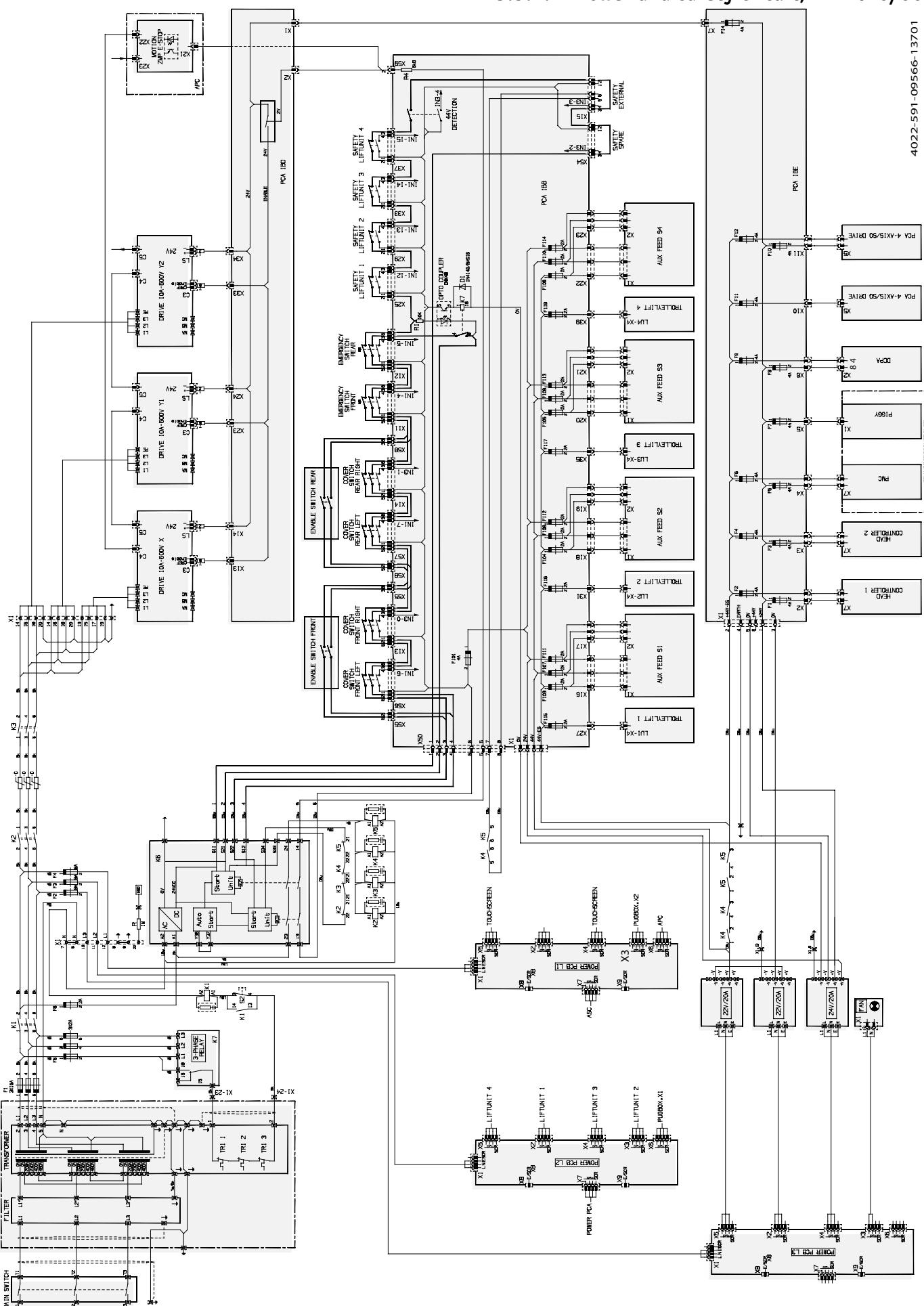


Figure 78 Power and safety circuit

B5.3 Reference information

B5.3.1 Control supply, lay-out

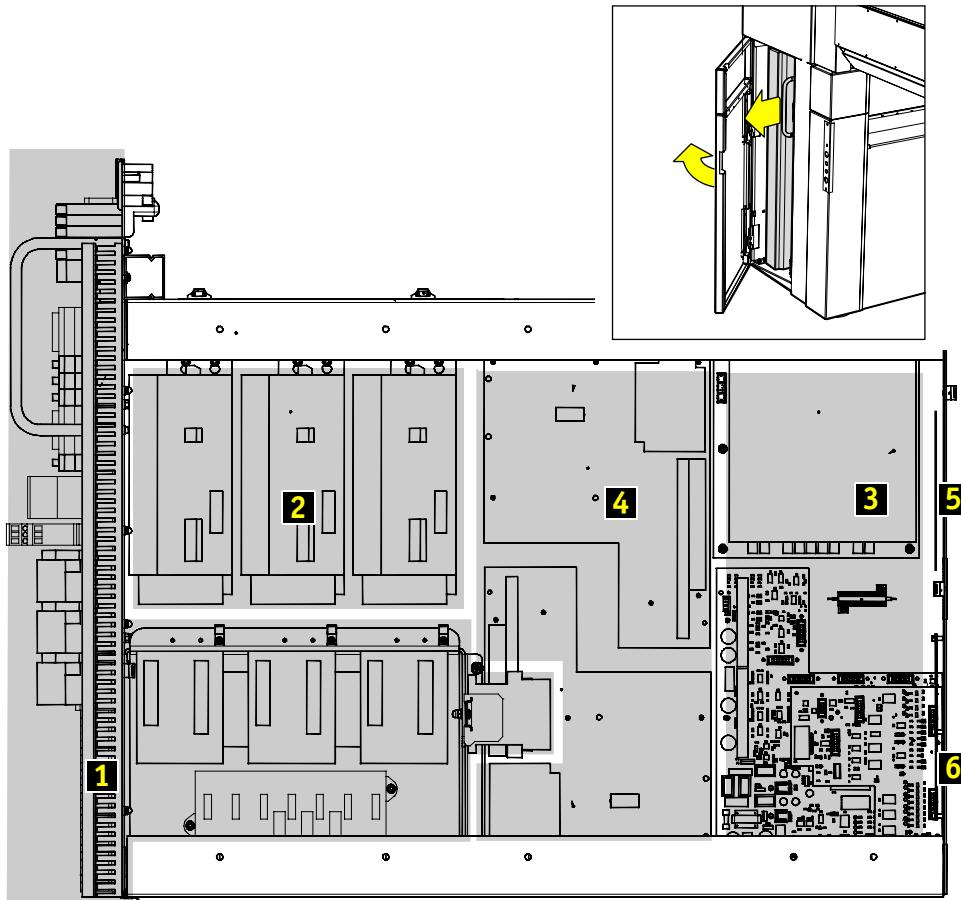


Figure 30 Control supply, lay-out

Item	Part of module	Reference
1	Base	B5.3.9 Mains supply PA 2410/00, features B5.3.9 Mains supply PA 2410/01, features
2	XY robot	G5.3.4 Motion amplifier, connections
3	Board transport	C5.3.1 Transport controller, LED status check
4	Pick and place	D5.3.4 Placement head HA controller, features
5	XY robot	G5.3.2 Interconnection board drives (IBD), connections
6	Base	B5.3.14 Interconnection board electrics, fuses and LED signalling

Figure 31 Control supply, lay-out

B5.3.2 Controllers, connections

B5.3.2.1 Controllers in PA 2410/01, connections

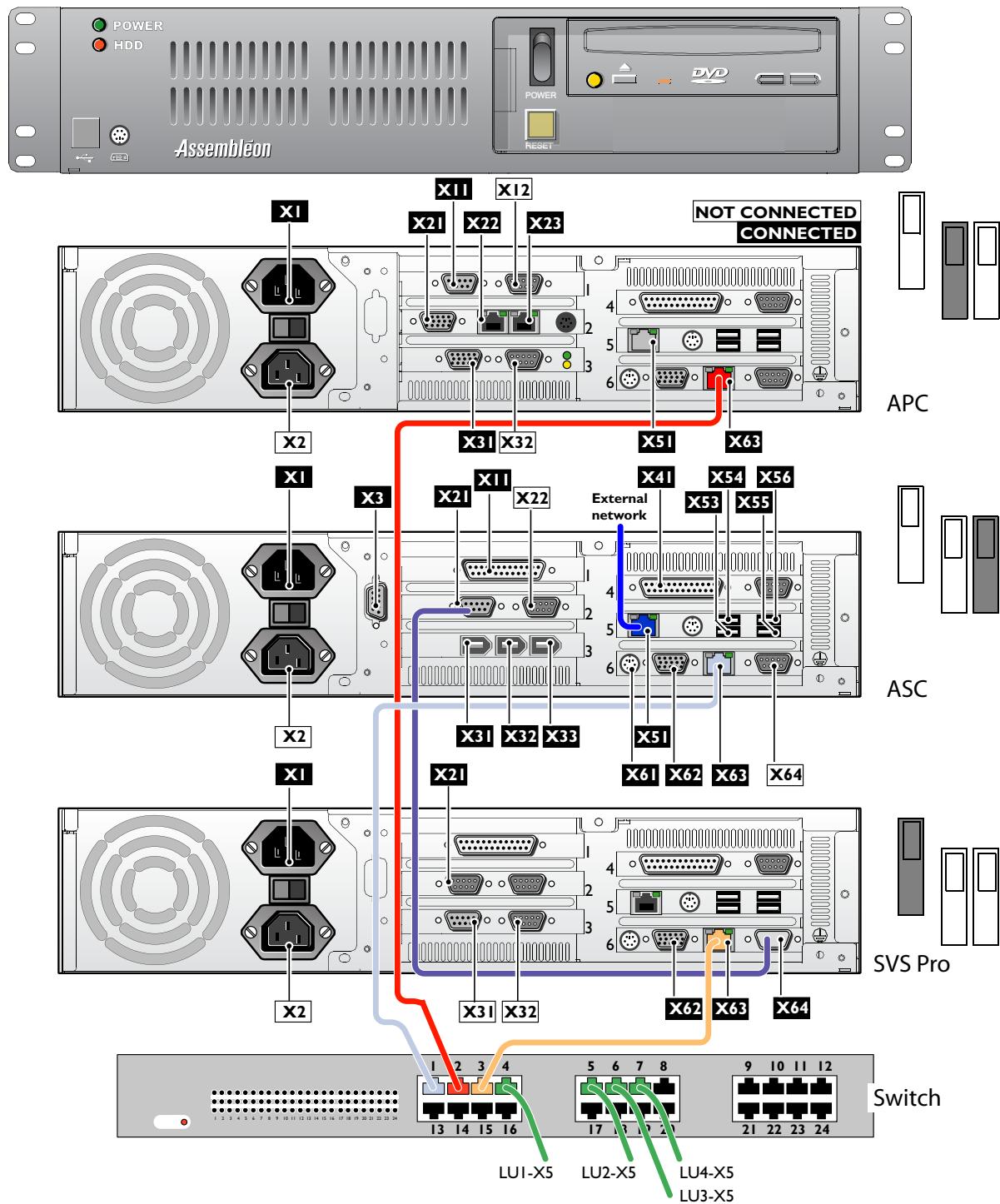


Figure 32 Controllers in PA 2410/01, connections overview

Controller	Tag	Remarks
APC	APC.X1	Power supply
	APC.X11	CAN connection to interface board base
	APC.X21	Emergency stop XY robot
	APC.X22	Synqnet OUT
	APC.X23	Synqnet IN
	APC.X31	Bitbus
	APC.X63	Internal network connection to switch 2
ASC	ASC.X1	Power supply
	ASC.X3	Power supply 24V BA camera
	ASC.X11	LPT2, Software key
	ASC.X21	COM3 SVS (optional)
	ASC.X31	CA camera front
	ASC.X32	BA camera front/rear
	ASC.X33	CA camera rear
	ASC.X41	LPT1, trigger BA camera
	ASC.X42	COM2 1 st BTCO
	ASC.X51	External network connection to front side
	ASC.X53	Memory stick
	ASC.X54	USB port cable to front side
	ASC.X55	Touch screen front
	ASC.X56	Touch screen rear
	ASC.X61	Keyboard
SVS Pro (optional)	ASC.X62	VGA to monitor splitter
	ASC.X63	Internal network connection to switch 1
	ASC.X64	Touch screen front
	SVSPRO.X1	Power supply
	SVSPRO.X21	COM3 Scanner
	SVSPRO.X62	VGA to ext. monitor
	SVSPRO.X63	Internal network connection to switch 3
	SVSPRO.X64	COM1 Internal connection to ASC.X21

Figure 33 Controllers in PA 2410/01, connections overview

B5.3.2.2 Controllers in PA 2410/00, connections

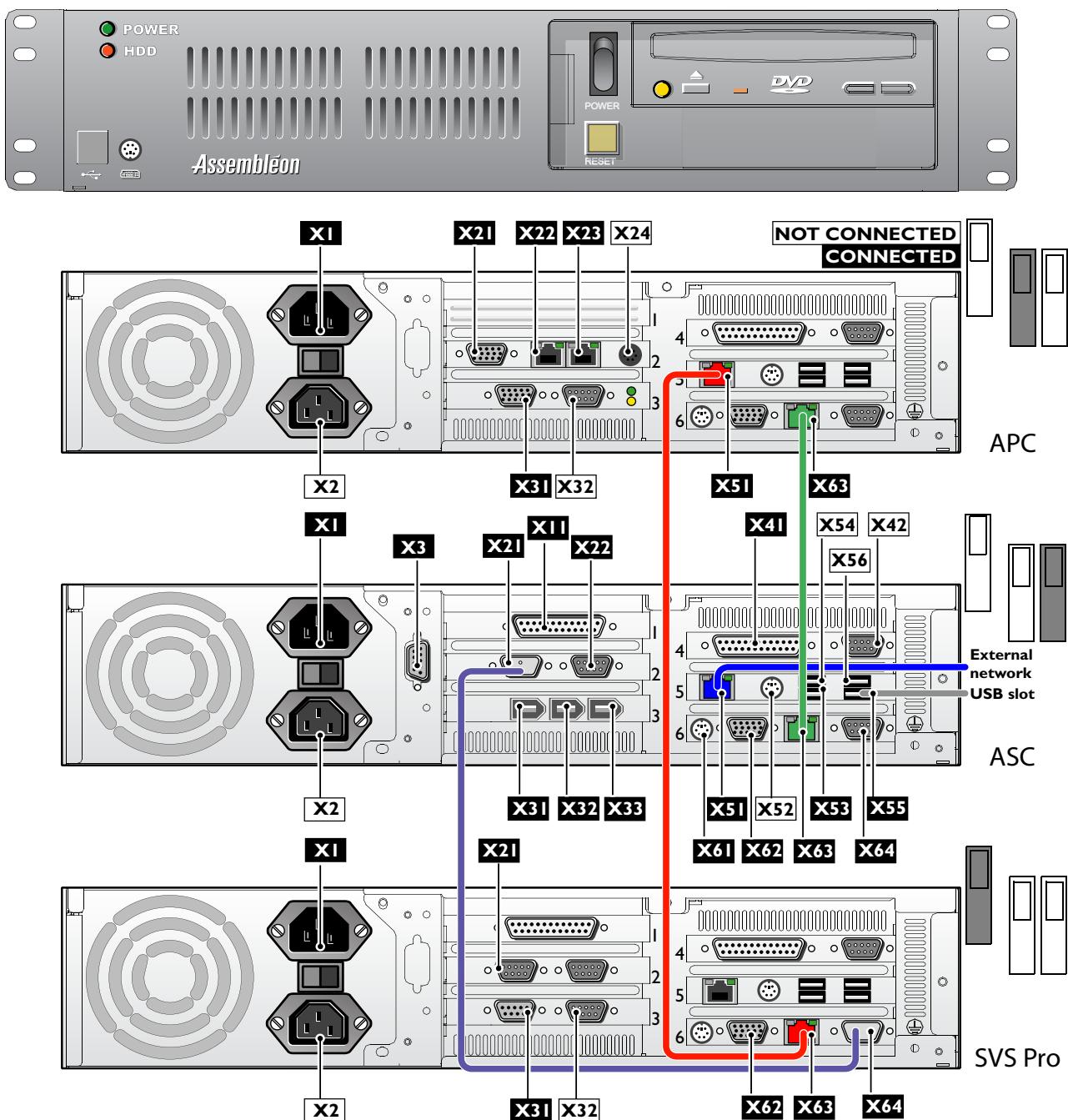


Figure 34 Controllers in PA 2410/00, connections overview

Controller	Tag	Remarks
APC	APC.X1	Power supply
	APC.X21	Emergency stop XY robot
	APC.X22	Synqnet OUT
	APC.X23	Synqnet IN
	APC.X31	Bitbus
	APC.X63	Internal network connection to ASC.X63
ASC	ASC.X1	Power supply
	ASC.X3	Power supply 24V BA camera
	ASC.X11	LPT2, Software key
	ASC.X21	COM3 SVS (optional)
	ASC.X22	Touch screen rear
	ASC.X31	CA camera front
	ASC.X32	BA camera front/rear
	ASC.X33	CA camera rear
	ASC.X41	LPT1, trigger BA camera
	ASC.X42	COM2 1 st BTCO
	ASC.X51	External network connection to front side
	ASC.X53	Memory stick
	ASC.X55	USB port cable to front side
	ASC.X61	Keyboard
	ASC.X62	VGA to monitor splitter
SVS Pro (optional)	SVSPRO.X1	Power supply
	SVSPRO.X21	COM3 Scanner
	SVSPRO.X31	CAN SVS Pro - IBB
	SVSPRO.X62	VGA to ext. monitor
	SVSPRO.X63	Internal network connection to APC.X51
	SVSPRO.X64	COM1 Internal connection to ASC.X21

Figure 35 Controllers in PA 2410/00, connections overview

B5.3.3 Controllers, BIOS settings

	System controller (ASC)	Process controller (APC)	SVS Pro controller
IDE HDD AUTO DETECTION	Let Bios search for type of harddisk, accept standard choices.		
STANDARD CMOS FEATURES			
Time	<Set Time>		
Date	<Set Date>		
IDE Primary Master	<filled by 'ide hdd auto detection'>		
IDE Primary Slave	<filled by 'ide hdd auto detection'>		
IDE Secondary Master	None		
IDE Secondary Slave	None		
Drive A:	None		
Drive B	None		
Video	EGA/VGA		
Halt on	All, but keyboard		
ADVANCED BIOS FEATURES			
CPU feature	Press Enter	Press Enter	-
X Thermal Management	Thermal Monitor 1	Thermal Monitor 1	-
Virus Warning	Disabled		
CPU L1 & L2 Cache	Enabled		
Quick Power on Self Test.	Enabled		
First Boot Device	USB-FDD	CDROM	FLOPPY
Second Boot Device	CDROM	LAN1	CDROM
Third Boot Device	HDD-0		
Boot Other Device	Enabled		
Swap Floppy drive	Disabled		
Boot up floppy seek	Disabled		
Boot up Numlock Status	On		
Gate A20 option	Fast		
Typematic rate setting	Disabled		
X Typematic rate (chars/sec)	6		
X Typematic delay (msec)	250		
Security option	Setup		
APIC Mode	Enabled		
NPS Version Control For OS	1.4		
ADVANCED CHIPSET FEATURES			
DRAM Timing Selectable	By SPD		
X CAS Latency Time	2	2	2.5
X Active to Precharge Delay	6		
X DRAM RAS# to CAS# Delay	3		
X DRAM RAS# Precharge	3		
Memory Frequency For	Auto		
System Bios Cacheable	Enabled		
Video Bios Cacheable	Disabled		
Memory hole at 15M-16M	Disabled		
Delayed Transaction	Enabled		
Delay Prior to Thermal	16 Min		
Continuous LAN Retry	Enabled	Enabled	-
AGP Graphics Aperture size	64		
Display Cache frequency	133MHz	133MHz	-
FWH write protection	Disabled	Disabled	-
On chip Video window size	64MB	64MB	-
** On-chip VGA settings **			

	System controller (ASC)	Process controller (APC)	SVS Pro controller
On-Chip VGA		Enabled	
On-Chip Frame Buffer Size		8MB	
Boot Display		Auto	
INTEGRATED PERIPHERALS			
On-Chip Primary PCI IDE		Enabled	
IDE Primary Master PIO		Auto	
IDE Primary Slave PIO		Auto	
IDE Primary Master UDMA		Auto	
IDE Primary Slave UDMA		Auto	
On-Chip Secondary PCI IDE		Enabled	
IDE Secondary Master PIO		Auto	
IDE Secondary Slave PIO		Auto	
IDE Secondary Master UDMA		Auto	
IDE Secondary Slave UDMA		Auto	
USB controller	Enabled	Disabled	Enabled
USB 2.0 Controller	Enabled	Disabled	Enabled
USB Keyboard Support		Disabled	
USB Mouse Support		Disabled	
AC97 Audio		Auto	
Onboard LAN1 Device		Enabled	
Onboard LAN2 Device		Enabled	
Init Display First		PCI Slot	
IDE HDD Block Mode		Enabled	
Onboard FDC Controller		Enabled	
Onboard Serial Port 1		3F8/IRQ 4	
Onboard Serial Port 2		2F8/IRQ 3	
UART mode select		Normal	
X RxD , TxD Active		Hi,Lo	
X IR Transmission Delay		Enabled	
X UR2 Duplex Mode		Half	
X Use IR Pins		IR-Rx2Tx2	
Onboard Parallel Port		378/IRQ 7	
Parallel Port Mode		SPP	
X EPP Mode Select		EPP1.7	
X ECP Mode Use DMA		3	
POWER MANAGEMENT SETUP			
Power-Supply Type		ATX	
ACPI function		Enabled	
Power management		User define	
Video Off Method		DPMS	
Video Off in suspend		Yes	
Suspend type		Stop Grant	
MODEM Use IRQ		NA	
Suspend mode		Disabled	
HDD Power down		Disabled	
Soft-Off by PWR-BTTN		Instant off	
CPU THRM-Throttling		50%	
PowerOn by LAN		Enabled	
PowerOn by Modem		Enabled	
PowerOn by Alarm		Disabled	
X Date(of Month) Alarm		0	
X Time(hh:mm:ss) Alarm		0 : 0 : 0	
** Reload Global Timer Events **			

	System controller (ASC)	Process controller (APC)	SVS Pro controller
Primary IDE 0		Disabled	
Primary IDE 1		Disabled	
Secondary IDE 0		Disabled	
Secondary IDE 1		Disabled	
FDD / COM / LPT port		Disabled	
PCI PIRQ (A-D) #		Disabled	
PWRON After PWR-Fail		On	
PNP/PCI CONFIGURATION			
PNP OS Installed	Yes	Yes	No
Reset Configuration Data		Disabled	
Resources controlled by		Manual	
IRQ-3		Legacy ISA	
IRQ-4		Legacy ISA	
IRQ-5		PCI/ISA PnP	
IRQ-7		Legacy ISA	
IRQ-9		PCI/ISA PnP	
IRQ-10		PCI/ISA PnP	
IRQ-11		PCI/ISA PnP	
IRQ-12	Legacy ISA	PCI/ISA PnP	Legacy ISA
IRQ-14	PCI/ISA PnP	Legacy ISA	PCI/ISA PnP
IRQ-15		PCI/ISA PnP	
DMA-0		PCI/ISA PnP	
DMA-1		PCI/ISA PnP	
DMA-3		PCI/ISA PnP	
DMA-5		PCI/ISA PnP	
DMA-6		PCI/ISA PnP	
DMA-7		PCI/ISA PnP	
PCI/VGA palette snoop		Disabled	
PC HEALTH STATUS			
CPU warning temperature	Disabled	Disabled	70°C/158°F
ACPI Shutdown Temperature		Disabled	
FREQUENCY / VOLTAGE CONTROL			
Auto Detect PCI Clk	Disabled	Enabled	-
CPU clock / spread spectrum		Disabled	

Figure 36 BIOS settings

B5.3.4 Controllers, features

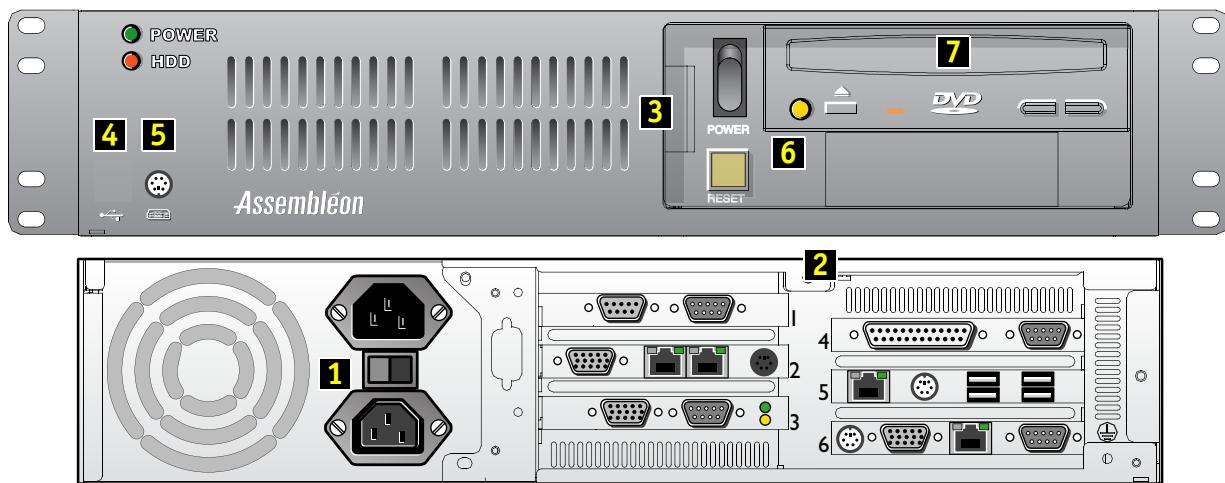


Figure 37 *Controllers, features*

No.	Item	Remarks
1	Power supply	300W ATX
2	Slots	System controller, see B5.3.5. System controller, slots Process controller, see B5.3.6. Process controller, slots SVS Pro controller, see B5.3.7. SVS Pro controller, slots
3	Air filter	B7.5 Filter in controllers, replacement
4	Cover	
5	Keyboard connection, front	PS/2
6	Hard disk	IDE 40GB
7	DVD-ROM drive	24 speed

Figure 38 *Controller, features*

B5.3.5 System controller, slots

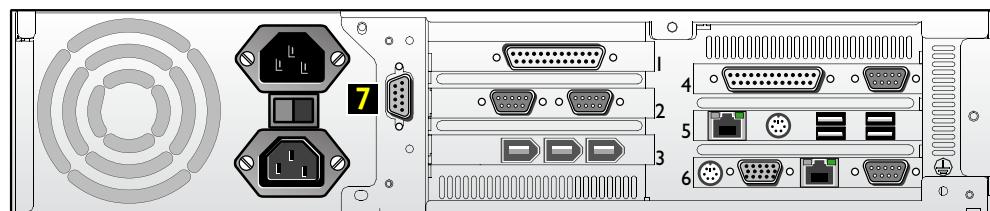


Figure 39 System controller, connections

Slot	Card	Remarks
1	RS232/LPT card	B5.3.5.2. RS232/LPT card LPT2
2		COM3, COM4
3	Firewire card	B5.3.5.1. Firewire card, settings with additional power supply (7)
4	Mother board	COM1,LPT1
5		Network, USB
6		Single board computer

Figure 40 System controller, connections

B5.3.5.1 Firewire card, settings



Figure 41 Firewire card, settings

No settings apply.

B5.3.5.2 RS232/LPT card

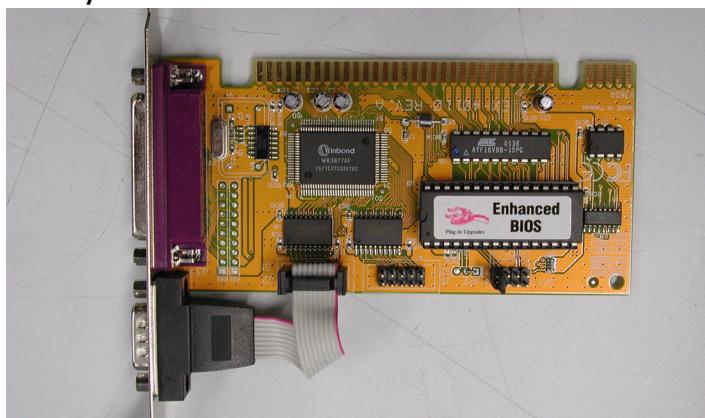


Figure 42

B5.3.6 Process controller, slots

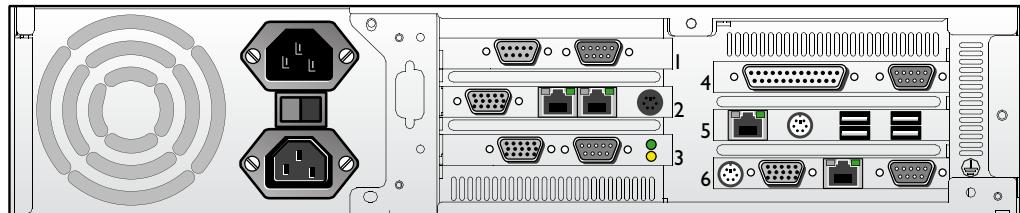


Figure 43 Process controller, slots

Slot	Card	Connection	Remarks
1	CAN	B5.3.6.1. CAN interface board, settings	PA 2410/01 only
2	XY controller	G5.3.1 XY controller, settings	
3	Bitbus	B5.3.6.2. Bitbus card, settings	
4	Mother board	COM1,LPT1	
5		Network, USB	
6		Single board computer	

Figure 44 Process controller, slots

B5.3.6.1 CAN interface board, settings



Figure 45 CAN interface board

B5.3.6.2 Bitbus card, settings

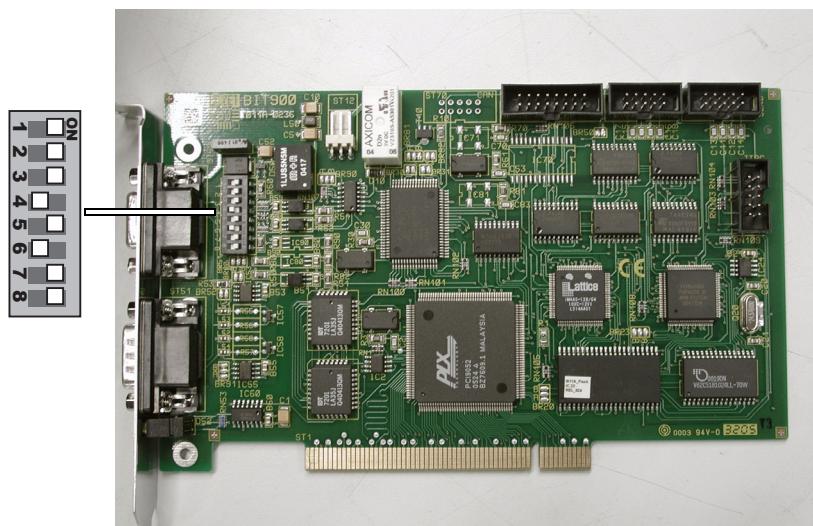


Figure 46 Bitbus card

B5.3.7 SVS Pro controller, slots

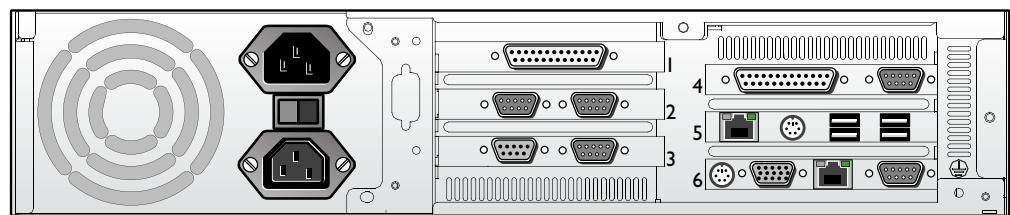


Figure 47 SVS Pro controller, slots

Slot	Card	Remarks
1	Multi I/O board	B5.3.7.1. Multi I/O card
2		
3	CAN Interface Board	B5.3.7.2. CAN interface board
4	Mother board	COM1,LPT1
5		Network, USB
6		Single board computer

Figure 48 SVS Pro controller, slots

B5.3.7.1 Multi I/O card

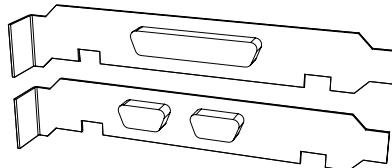


Figure 49 Multi I/O card

B5.3.7.2 CAN interface board

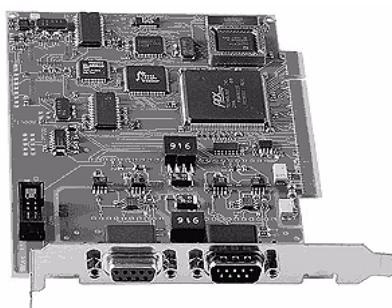


Figure 50 CAN interface board

B5.3.8 Mains supply PA 2410/01, features

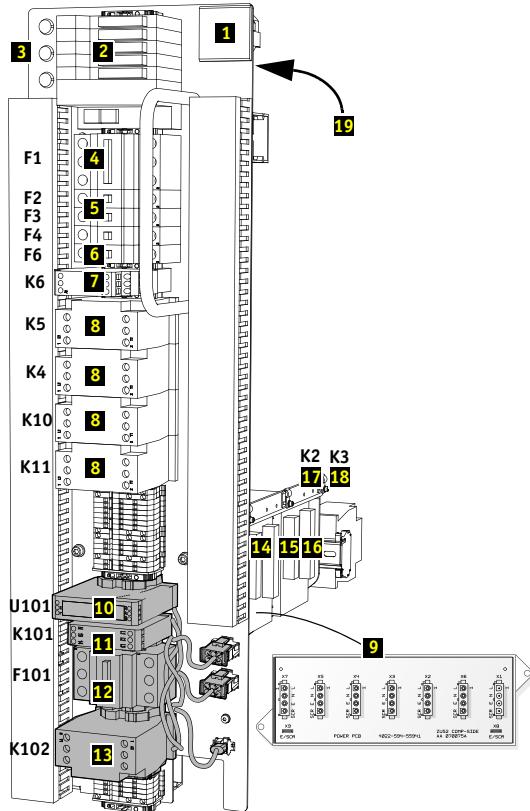
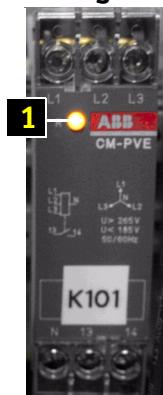


Figure 51 Mains supply PA 2410/01, features

Item	Label	Description	Remarks	Reference
1	-	Hours counter		-
2	-	Digital I/O		B5.3.9.4
3	-	Phase presence LEDs		
4	F1	Circ. breaker 16A/ 3P		-
5	F2	Circ. breaker 1P/8A	Power board 1, see B5.3.9.3	
	F3	Circ. breaker 1P/8A	Power board 2, see B5.3.9.3	
	F4	Circ. breaker 1P/8A	Power board 3, see B5.3.9.3	
6	F6	Circ. breaker 1P/4A		
7	K6	Safety relay	24V	B5.3.9.2
8	K5	Electric magnetic switch		
	K4	Electric magnetic switch		
	K10	Electric magnetic switch		
	K11	Electric magnetic switch		
9	-	Power board 3		B5.3.9.3
Machine with A-series transformer only				
10	U101	Power supply for K102		B5.3.8.2
11	K101	Phase guard relay		B5.3.8.1
12	F101	Circuit breaker, 3x4A	Protects the phase guard relay (K101) and the 24 V power supply (U101)	
13	K102	Power on relay		
14	-	Power supply unit 230V-24V DC/20A	22 Volts	-
15	-	Power supply unit 230V-24V DC/20A	22 Volts	-
16	-	Power supply unit 230V-24V DC/20A	24 Volts	-
17	K3	Electric magnetic switch	Motion amplifier XY robot	-
18	K2	Electric magnetic switch	Motion amplifier XY robot	-
19	-	ESD connection point		

Figure 52 Mains supply PA 2410/01, features

B5.3.8.1 Phase guard relay (K101), features*Figure 53 Phase guard relay in transformer*

LED	Colour	LED illuminated meaning
1 R	Orange	3 phase voltage OK. (No phase sequence check)

*Figure 54 Phase guard relay in transformer***B5.3.8.2 Power supply (U101, 24 V), features***Figure 55 Power supply (24 V) in transformer*

LED	Colour	LED illuminated meaning
1 DC OK	Green	DC output OK

Figure 56 Power supply (24 V) in transformer

B5.3.9 Mains supply PA 2410/00, features

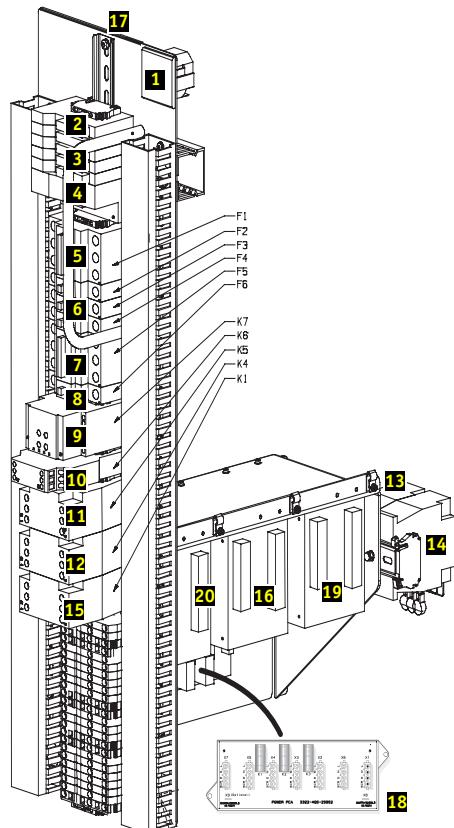


Figure 57

Item	Label	Description	Remarks	Reference
1	-	Hours counter		-
2,3,4	-	Digital I/O		B5.3.9.4
5	F1	Circ. breaker 3P/16A		-
6	F2	Circ. breaker 1P/8A	Power board 1	B5.3.9.3
	F3	Circ. breaker 1P/8A	Power board 2	B5.3.9.3
	F4	Circ. breaker 1P/8A	Power board 3	B5.3.9.3
7	F5	Circ. breaker 3P/2A	Phase guard relay	-
8	F6	Circ. breaker 1P/2A	Safety relay	-
9	K7	Phase guard relays		B5.3.9.1
10	K6	Safety relay	230V	B5.3.9.2
11	K5	Electric magnetic switch	44 Volts heads etc.	-
12	K4	Electric magnetic switch	44 Volts heads etc.	-
13	K3	Electric magnetic switch	Motion amplifier XY robot	-
14	K2	Electric magnetic switch	Motion amplifier XY robot	-
15	K1	Electric magnetic switch	Main power	-
16	-	Power supply unit 230V-24V DC/20A	22 Volts	-
17	-	ESD connection point		-
18	-	Power board 3		B5.3.9.3
19	-	Power supply unit 230V-24V DC/20A	24 Volts	-
20	-	Power supply unit 230V-24V DC/20A	22 Volts	-

Figure 58 Mains supply, features

B5.3.9.1 Phase guard relay (K7), features

Figure 59 Phase guard relay

Only applicable for PA 2410/00

LED	Colour	Meaning
1	Yellow	Output relay on
2	Yellow	Output relay on
3	Red	Alarm on: not all 3 phases are present and / or phase sequence is incorrect
4	Green	Power supply on

Figure 60 Phase guard relay, LED signalling

Setting	Value	Meaning
5	20%	Asymmetry
6	20%	Tolerance
7	3 s	Delay 1
8	3 s	Delay 2
9	-	Dip switch settings according picture

Figure 61 Phase guard relay, settings

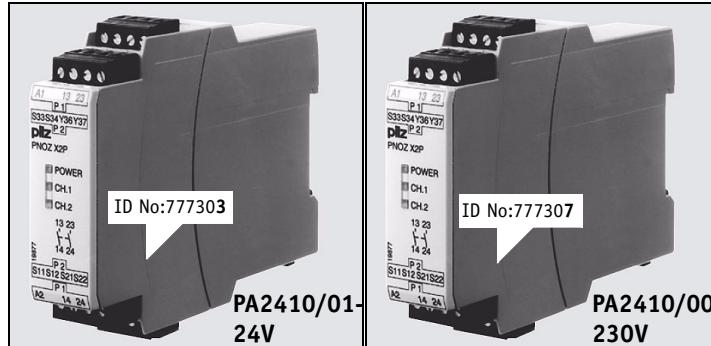
B5.3.9.2 Safety relay (K6), features

Figure 62 Safety relay

Don't mix up the safety relay (24V or 230V).

LED	Meaning
Power	Supply voltage is present on terminals (A1/A2)
CH.1	Safety sensing circuit 1 OK (incl. trolley lift etc.)
CH.2	Safety sensing circuit 2 OK

Figure 63 Safety relay, LED signalling

B5.3.9.3 Power board, connections

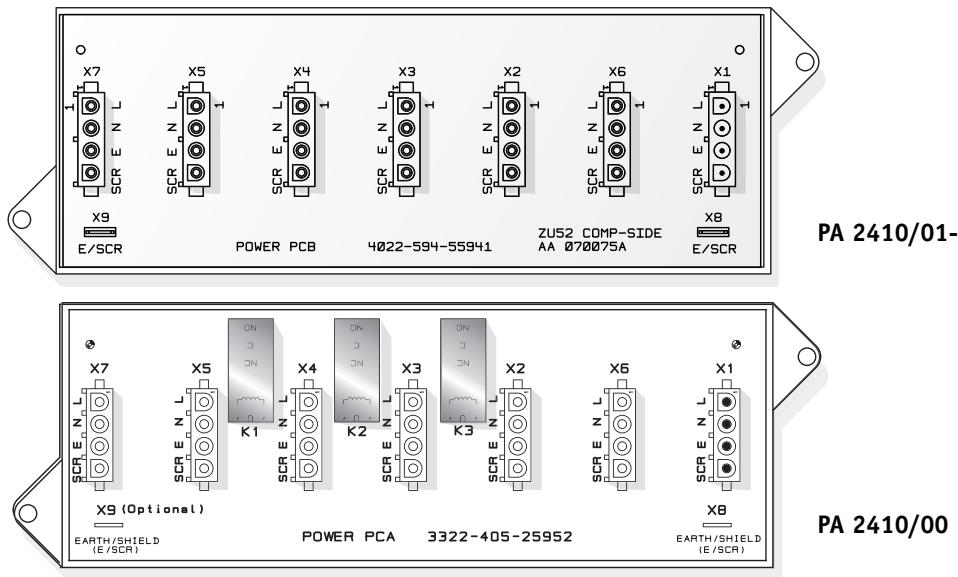


Figure 64 Power board

Power board	Item
1 On top of process and system controller	X1 230V Power supply from mains supply unit (F2) X2 Spare X3 SVS scanner / controller X4 Monitor rear X5 monitor front X6 Process controller (APC) X7 System controller (ASC)
2 On top of process and system controller	X1 230V Power supply from mains supply unit (F3) X2 Trolley lift 1 X3 Trolley lift 2 X4 Trolley lift 3 X5 Trolley lift 4 X6 Splitter touch screen VGA second user interface X7 Switch internal network, PA 2410/01
3 In control supply unit	X1 230V Power supply from mains supply unit (F4) X2 Power supply 24V X3 Fans in hood, power board 4 X4 Power supply 24V X5 Power supply 24V X6 - X7 Safety relay (K6)
4 In hood	X1 230V Power supply from power board 3, X3 X2 Fan hood right rear X3 Fan hood left front X4 Fan hood left rear X5 Fan hood right front

Figure 65 Power board, connections

B5.3.9.4 Digital I/O, LED signalling

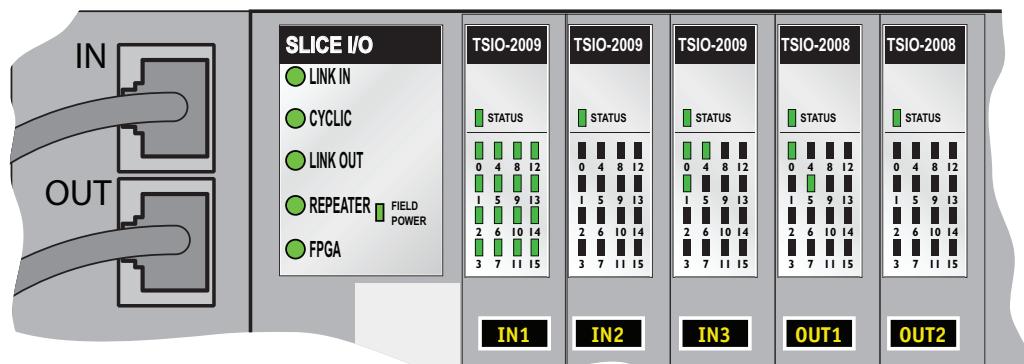


Figure 66 Digital I/O, LED signalling

Slice I/O	
LINK IN	Synqnet IN from Y2 amplifier
CYCLIC	-
LINK OUT	Synqnet OUT to Y2 placement DV controller
REPEATER	-
FPGA	Field programmable gate array
FIELD POWER	-

Inputs		Outputs	
IN1-0	Compressed Air Level OK	OUT1-0	Lamp White (Idle)
IN1-1	Vacuum Level OK	OUT1-1	Lamp Blue (Error)
IN1-2	Bitbus Nodes OK	OUT1-2	Lamp Green (Running)
IN1-3	Servo Power On	OUT1-3	Audio Beeper
IN1-4	Emergency Stop Front	OUT1-4	Trolley Exchange
IN1-5	Emergency Stop Rear	OUT1-5	Quick Stop Bitbus Nodes
IN1-6	Emergency Stop Cover Open Front Left	OUT1-6	Blower CA front/rear
IN1-7	Emergency Stop Cover Open Rear Left	OUT1-7	-
IN1-8	Feeder Ready Section 1	OUT1-8	Valve 1 (verification tool)
IN1-9	Feeder Ready Section 2	OUT1-9	Valve 2 (verification tool)
IN1-10	Feeder Ready Section 3	OUT1-10	Valve 3 (verification tool)
IN1-11	Feeder Ready Section 4	OUT1-11	Valve 4 (verification tool)
IN1-12	Emergency Stop Trolley Lift 1	OUT1-12	Claim fluxer
IN1-13	Emergency Stop Trolley Lift 2	OUT1-13	-
IN1-14	Emergency Stop Trolley Lift 3	OUT1-14	-
IN1-15	Emergency Stop Trolley Lift 4	OUT1-15	-
Inputs		Outputs	
IN2-0	Input aux. Feeding Front S1-C1-1	OUT2-0	Output aux. Feeding Front S1-C1-1
IN2-1	Input aux. Feeding Front S1-C1-2	OUT2-1	Output aux. Feeding Front S1-C1-2
IN2-2	Input aux. Feeding Front S1-C2-1	OUT2-2	Output aux. Feeding Front S1-C2-1
IN2-3	Input aux. Feeding Front S1-C2-2	OUT2-3	Output aux. Feeding Front S1-C2-2
IN2-4	Input aux. Feeding Front S2-C1-1	OUT2-4	Output aux. Feeding Front S2-C1-1
IN2-5	Input aux. Feeding Front S2-C1-2	OUT2-5	Output aux. Feeding Front S2-C1-2
IN2-6	Input aux. Feeding Front S2-C2-1	OUT2-6	Output aux. Feeding Front S2-C2-1
IN2-7	Input aux. Feeding Front S2-C2-2	OUT2-7	Output aux. Feeding Front S2-C2-2
IN2-8	Input aux. Feeding Rear S3-C1-1	OUT2-8	Output aux. Feeding Rear S3-C1-1
IN2-9	Input aux. Feeding Rear S3-C1-2	OUT2-9	Output aux. Feeding Rear S3-C1-2
IN2-10	Input aux. Feeding Rear S3-C2-1	OUT2-10	Output aux. Feeding Rear S3-C2-1
IN2-11	Input aux. Feeding Rear S3-C2-2	OUT2-11	Output aux. Feeding Rear S3-C2-2
IN2-12	Input aux. Feeding Rear S4-C1-1	OUT2-12	Output aux. Feeding Rear S4-C1-1
IN2-13	Input aux. Feeding Rear S4-C1-2	OUT2-13	Output aux. Feeding Rear S4-C1-2
IN2-14	Input aux. Feeding Rear S4-C2-1	OUT2-14	Output aux. Feeding Rear S4-C2-1
IN2-15	Input aux. Feeding Rear S4-C2-2	OUT2-15	Output aux. Feeding Rear S4-C2-2

Inputs	Outputs
IN3-0	E-stop Cover Open Front Right
IN3-1	E-stop Cover Open Rear Right
IN3-2	E-stop spare
IN3-3	E-stop External
IN3-4	No overvoltage (44V)
IN3-5	E-stop spare +external
IN3-6	Fluxer ready
IN3-7	Fluxer cover placed
IN3-8	-
IN3-9	-
IN3-10	-
IN3-11	-
IN3-12	-
IN3-13	-
IN3-14	-
IN3-15	-

B5.3.10 Air supply unit, features

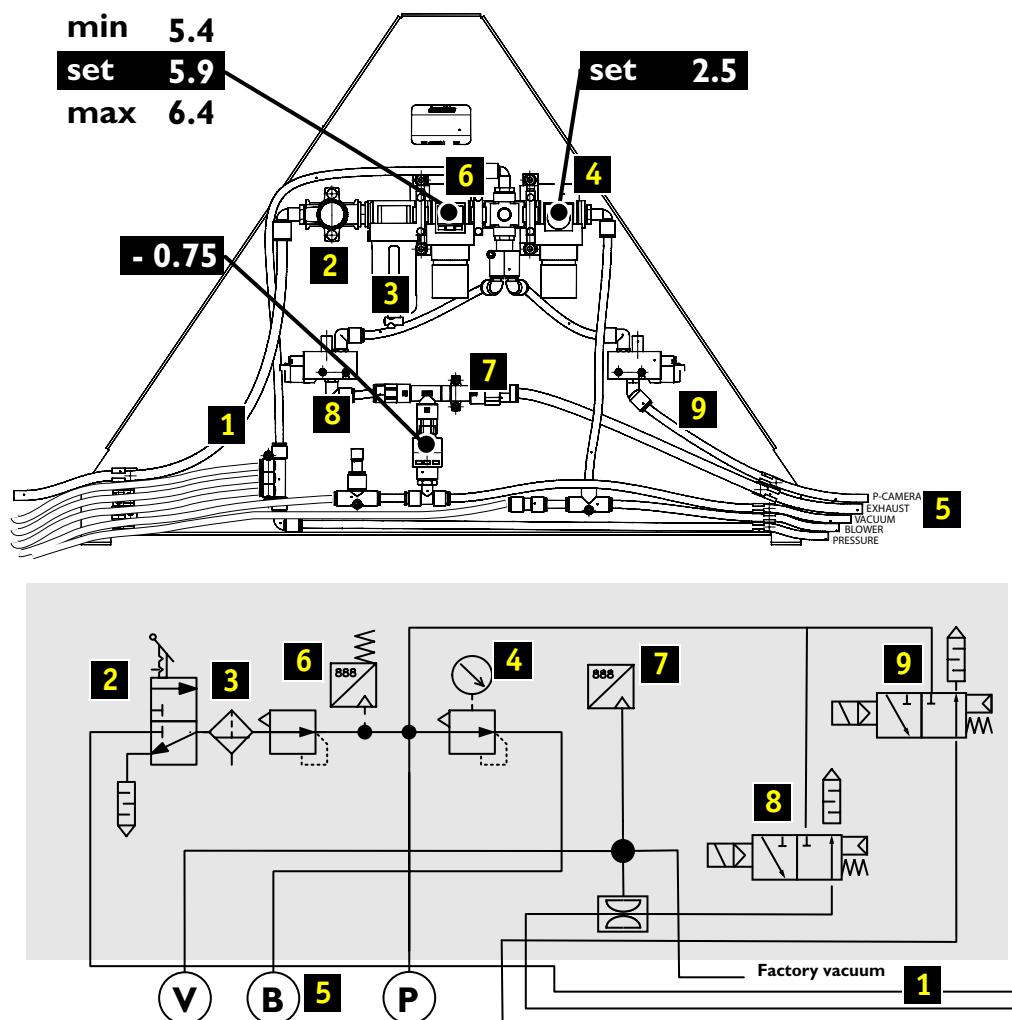


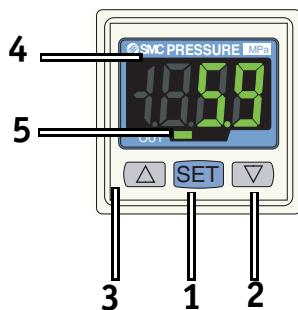
Figure 67 Air supply unit, components

No.	Description
1	Compressed air supply
2	Main air valve (open, closed)
3	Air filter, 0.3 µm
4	Analog pressure gauge
5	Output
6	Digital pressure switch
7	Digital vacuum switch
8	Vacuum valve
9	Pressure valve

Figure 68 Air supply unit

Diagram, see [B5.4.5 Air and vacuum, diagram](#) .

B5.3.10.1 Digital pressure switch, settings



No.		Function
1	SET	Button used to switch the mode, and to set the value.
2,3	UP,DOWN button	Use to change mode and set value
4	LCD Display	Display the measured pressure value, each set content or error code.
5	LED (green)	Displays the switch operation status

Figure 69 Digital pressure switch

Unit	Value	Display
'Initial set' mode		
Unit	Bar	bAr
Display colour		SoG
Operating mode		Ynd
Output type set	Normal open	no
Response time	640 msec	640
'Pressure set' mode		
Pressure set	Min. 5.4 Bar	P_1 / 5.40
	Max. 6.4 Bar	P_2 / 6.40

Figure 70 Settings digital pressure switch

Error code	Error name	Problem	Solution
Er1	Current overload error	Current switch output >80mA	Switch off main power, recover fault and switch on main power.
Er3	Residual pressure error.	Pressure detecting during zero reset. After 3 sec. system returns automatically to measuring mode.	Change applied pressure into atmospheric pressure. Repeat zero reset.
HHH	Applied pressure error	Applied pressure exceeds min. or max. limit of pressure range.	Reduce or increase supply pressure to within the regulating pressure range.
LLL			
Er4	System error	Internal system/data error.	Switch off main power, and switch on again. If problem persists, replace the digital pressure switch.
Er6			
Er7			
Er8			

Figure 71 Errors on display digital pressure switch

B5.3.11 Interconnection board base, fuses and LED signalling

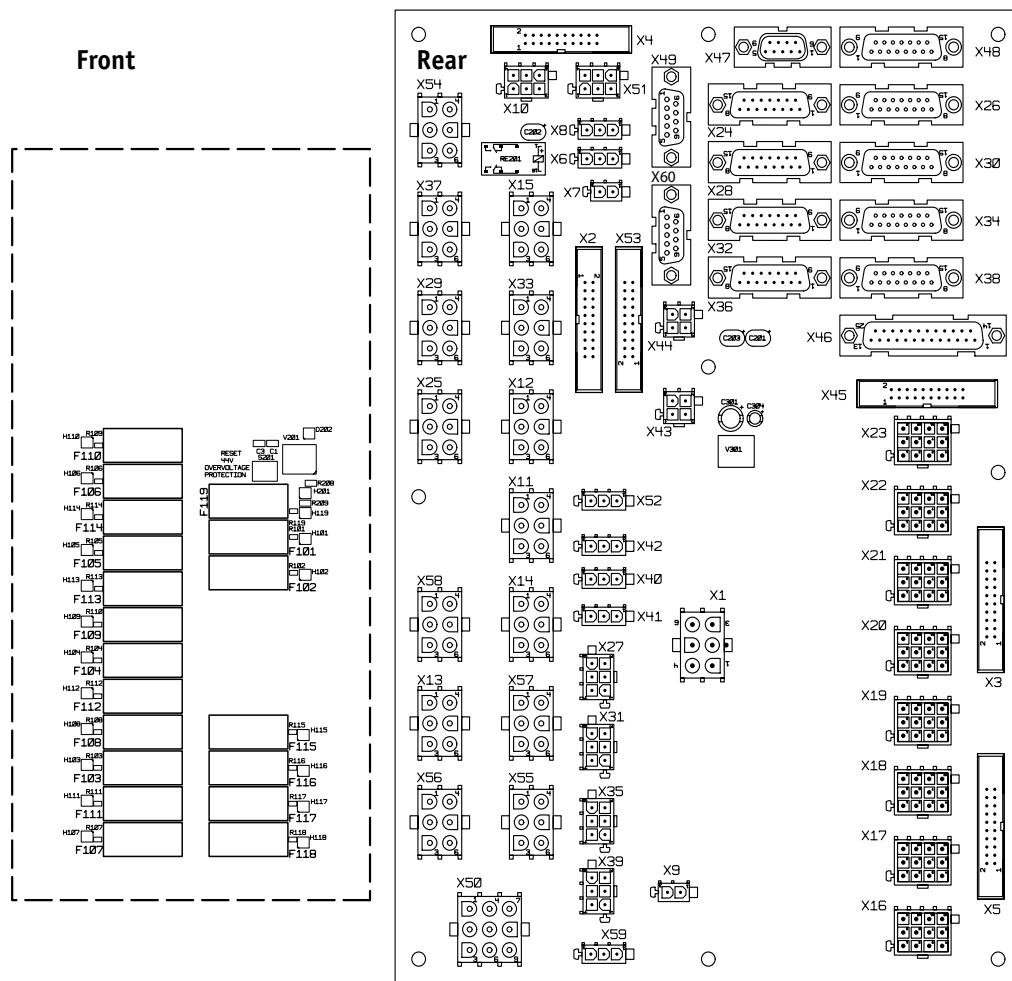


Figure 72 Interconnection board base, fuses and LED signalling

Fuse	Amp		LED	Colour
F101	4AT	24V - IO	H101	Green
F102	4AT	24V - camera	H102	Green
F103	2AT	24V - Aux. feeding S1	H103	Green
F104	2AT	24V - Aux. feeding S2	H104	Green
F105	2AT	24V - Aux. feeding S3	H105	Green
F106	2AT	24V - Aux. feeding S4	H106	Green
F107	2AT	45V - Aux. feeding S1	H107	Green
F108	2AT	45V - Aux. feeding S2	H108	Green
F109	2AT	45V - Aux. feeding S3	H109	Green
F110	2AT	45V - Aux. feeding S4	H110	Green
F111	2AT	45V - Emergency Stop - Aux. feeding S1	H111	Green
F112	2AT	45V - Emergency Stop - Aux. feeding S2	H112	Green
F113	2AT	45V - Emergency Stop - Aux. feeding S3	H113	Green
F114	2AT	45V - Emergency Stop - Aux. feeding S4	H114	Green
F115	2AT	45V - Trolley lift 1	H115	Green
F116	2AT	45V - Trolley lift 2	H116	Green
F117	2AT	45V - Trolley lift 3	H117	Green
F118	2AT	45V - Trolley lift 4	H118	Green
F119	4AT	24V - Fluxer	H119	Green
-	-	44V - Over voltage protection	H201	Red

Figure 73 Interconnection board base, fuses and LED signalling

B5.3.12 Interconnection board base, connections

Connection	Connection
X1 Supply in 24V/45V	X31 Trolleylift 2 45V-Emergency Stop
X2 16 Input Module 1	X32 Trolleylift 3 CAN
X3 16 Input Module 2	X33 Trolleylift 3 Emergency Stop
X4 16 Output Module 1	X34 Trolleylift 3 bitbus
X5 16 Output Module 2	X35 Trolleylift 3 45V-Emergency Stop
X6 Vacuum Sensor	X36 Trolleylift 4 CAN
X7 Valve (Vacuum)	X37 Trolleylift 4 Emergency Stop
X8 Pressed air sensor	X38 Trolleylift 4 bitbus
X9 Teller	X39 Trolleylift 4 45V-Emergency Stop
X10 Lamp post	X40 24V Supply CA Front
X11 Emergency Stop button front	X41 24V Supply CA Rear
X12 Emergency Stop button rear	X42 24V Supply BA1&2
X13 Emergency Stop cover front right	X43 Trigger Front
X14 Emergency Stop cover rear right	X44 Trigger Rear
X15 Spare External Safety	X45 Trigger BA1&2
X16 Aux feeding S1C1	X46 LPT1 controller
X17 Aux feeding S1C2	X47 CAN (from SVS controller or APC)
X18 Aux feeding S2C1	X48 Bitbus in from Interconnection Board 2
X19 Aux feeding S2C2	X49 Verification Tool
X20 Aux feeding S3C1	X50 to E-stop relay
X21 Aux feeding S3C2	X51 Blower CA front/rear
X22 Aux feeding S4C1	X52 24V supply Slice IO
X23 Aux feeding S4C2	X53 16 Input Module 3
X24 Trolleylift 1 CAN	X54 Emergency Stop spare
X25 Trolleylift 1 Emergency Stop	X55 Emergency Stop Enabling Switch Front
X26 Trolleylift 1 bitbus	X56 Emergency Stop Cover Front Left
X27 Trolleylift 1 45V-Emergency Stop	X57 Emergency Stop Cover Rear Left
X28 Trolleylift 2 CAN	X58 Emergency Stop Enabling Switch Rear
X29 Trolleylift 2 Emergency Stop	X59 Emergency Stop to XY controller
X30 Trolleylift 2 bitbus	X60 Fluxer

Figure 74

B5.3.13 Interconnection board base, signals

Pins	Description	Netname	Pins	Description	Netname
IBB.X1	Supply in				
1	24V	24V	4	EARTH	Earth
2	44V-ES	44V-ES	5	0V	0V
3	0V	0V	6	44V	44V
IBB.X2	16 Input Module 1				
1	IN1-0	IN1-0	11	IN1-10	IN1-10
2	IN1-1	IN1-1	12	IN1-11	IN1-11
3	IN1-2	IN1-2	13	IN1-12	IN1-12
4	IN1-3	IN1-3	14	IN1-13	IN1-13
5	IN1-4	IN1-4	15	IN1-14	IN1-14
6	IN1-5	IN1-5	16	IN1-15	IN1-15
7	IN1-6	IN1-6	17	0V	0V
8	IN1-7	IN1-7	18	0V	0V
9	IN1-8	IN1-8	19	24V	N.C.
10	IN1-9	IN1-9	20	24V	N.C.
IBB.X3	16 Input Module 2				
1	IN2-0	IN2-0	11	IN2-10	IN2-10
2	IN2-1	IN2-1	12	IN2-11	IN2-11
3	IN2-2	IN2-2	13	IN2-12	IN2-12

Pins	Description	Netname	Pins	Description	Netname
4	IN2-3	IN2-3	14	IN2-13	IN2-13
5	IN2-4	IN2-4	15	IN2-14	IN2-14
6	IN2-5	IN2-5	16	IN2-15	IN2-15
7	IN2-6	IN2-6	17	0V	0V
8	IN2-7	IN2-7	18	0V	0V
9	IN2-8	IN2-8	19	24V	N.C.
10	IN2-9	IN2-9	20	24V	N.C.
IBB.X4 16 Output Module 1					
1	OUT1-1	OUT1-1	11	OUT1-11	OUT1-11
2	OUT1-2	OUT1-2	12	OUT1-12	OUT1-12
3	OUT1-3	OUT1-3	13	OUT1-13	OUT1-13
4	OUT1-4	OUT1-4	14	OUT1-14	OUT1-14
5	OUT1-5	OUT1-5	15	OUT1-15	OUT1-15
6	OUT1-6	OUT1-6	16	OUT1-16	OUT1-16
7	OUT1-7	OUT1-7	17	0V	0V
8	OUT1-8	OUT1-8	18	0V	0V
9	OUT1-9	OUT1-9	19	24V	N.C.
10	OUT1-10	OUT1-10	20	24V	N.C.
IBB.X5 16 Output Module 2					
1	OUT2-1	OUT2-1	11	OUT2-11	OUT2-11
2	OUT2-2	OUT2-2	12	OUT2-12	OUT2-12
3	OUT2-3	OUT2-3	13	OUT2-13	OUT2-13
4	OUT2-4	OUT2-4	14	OUT2-14	OUT2-14
5	OUT2-5	OUT2-5	15	OUT2-15	OUT2-15
6	OUT2-6	OUT2-6	16	OUT2-16	OUT2-16
7	OUT2-7	OUT2-7	17	0V	0V
8	OUT2-8	OUT2-8	18	0V	0V
9	OUT2-9	OUT2-9	19	24V	N.C.
10	OUT2-10	OUT2-10	20	24V	N.C.
IBB.X6 Vacuum Sensor					
1	24V	24V-IO	3	0V	0V
2	Output	IN1-1			
IBB.X7 Valve (Vacuum)					
1	24V	24V-IO	2	0V	0V
IBB.X8 Pressed air sensor					
1	24V	24V-IO	3	0V	0V
2	Output	IN1-0			
IBB.X9 Teller					
1	24V	IN1-3	2	0V	0V
IBB.X10 Lamppost					
1	Lamp white	OUT1-0	4	Beeper	OUT1-3
2	Lamp blue	OUT1-1	5	N.C.	N.C.
3	Lamp green	OUT1-2	6	0V	0V
IBB.X11 ES button front					
1	Switch3	24V-IO	4	Switch3	IN1-4
2	Switch1	ES1-5	5	Switch2	ES2-5
3	Switch1	ES1-6	6	Switch2	ES2-6
IBB.X12 ES button rear					
1	Switch3	24V-IO	4	Switch3	IN1-5
2	Switch1	ES1-6	5	Switch2	ES2-6
3	Switch1	ES1-7	6	Switch2	ES2-7
IBB.X13 ES Cover Front Right					
1	Switch3	24V-IO	4	Switch3	IN3-0
2	Switch1	ES1-2	5	Switch2	ES2-2
3	Switch1	ES1-3	6	Switch2	ES2-3
IBB.X14 ES Cover Rear Right					

Pins	Description	Netname	Pins	Description	Netname
1	Switch3	24V-I0	4	Switch3	IN3-1
2	Switch1	ES1-4	5	Switch2	ES2-4
3	Switch1	ES1-5	6	Switch2	ES2-5
IBB.X15	ES External				
1	Detection	24V-I0	4	Detection	IN3-3
2	Input	ES1-12	5	Output	ES-SP1
3	Input	ES1-13	6	Output	ES-SP2
IBB.X16	Aux feeding S1C1				
1	24V	24V-AFS1	7	0V	0V
2	44V-ES	44V-ES-AFS1	8	0V	0V
3	0V	0V	9	Input aux. Feeding Front S1-C1-1	IN2-0
4	EARTH	Earth	10	Input aux. Feeding Front S1-S1-2	IN2-1
5	0V	0V	11	Output aux. Feeding Front S1-C1-1	OUT2-0
6	44V	44V-AFS1	12	Output aux. Feeding Front S1-C1-2	OUT2-1
IBB.X17	Aux feeding S1C2				
1	24V	24V-AFS1	7	0V	0V
2	44V-ES	44V-ES-AFS1	8	0V	0V
3	0V	0V	9	Input aux. Feeding Front S1-C2-1	IN2-2
4	EARTH	Earth	10	Input aux. Feeding Front S1-C2-2	IN2-3
5	0V	0V	11	Output aux. Feeding Front S1-C2-1	OUT2-2
6	44V	44V-AFS1	12	Output aux. Feeding Front S1-C2-2	OUT2-3
IBB.X18	Aux feeding S2C1				
1	24V	24V-AFS2	7	0V	0V
2	44V-ES	44V-ES-AFS2	8	0V	0V
3	0V	0V	9	Input aux. Feeding Front S2-C1-1	IN2-4
4	EARTH	Earth	10	Input aux. Feeding Front S2-C1-2	IN2-5
5	0V	0V	11	Output aux. Feeding Front S2-C1-1	OUT2-4
6	44V	44V-AFS2	12	Output aux. Feeding Front S2-C1-2	OUT2-5
IBB.X19	Aux feeding S2C2				
1	24V	24V-AFS2	7	0V	0V
2	44V-ES	44V-ES-AFS2	8	0V	0V
3	0V	0V	9	Input aux. Feeding Front S2-C2-1	IN2-6
4	EARTH	Earth	10	Input aux. Feeding Front S2-C2-2	IN2-7
5	0V	0V	11	Output aux. Feeding Front S2-C2-1	OUT2-6
6	44V	44V-AFS2	12	Output aux. Feeding Front S2-C2-2	OUT2-7
IBB.X20	Aux feeding S3C1				
1	24V	24V-AFS3	7	0V	0V
2	44V-ES	44V-ES-AFS3	8	0V	0V
3	0V	0V	9	Input aux. Feeding Rear S3-C1-1	IN2-8
4	EARTH	Earth	10	Input aux. Feeding Rear S3-C1-2	IN2-9
5	0V	0V	11	Output aux. Feeding Rear S3-C1-1	OUT2-8

Pins	Description	Netname	Pins	Description	Netname
6	44V	44V-AFS3	12	Output aux. Feeding Rear S3-C1-2	OUT2-9
IBB.X21 Aux feeding S3C2					
1	24V	24V-AFS3	7	0V	0V
2	44V-ES	44V-ES-AFS3	8	0V	0V
3	0V	0V	9	Input aux. Feeding Rear S3-C2-1	IN2-10
4	EARTH	Earth	10	Input aux. Feeding Rear S3-C2-2	IN2-11
5	0V	0V	11	Output aux. Feeding Rear S3-C2-1	OUT2-10
6	44V	44V-AFS3	12	Output aux. Feeding Rear S3-C2-2	OUT2-11
IBB.X22 Aux feeding S4C1					
1	24V	24V-AFS4	7	0V	0V
2	44V-ES	44V-ES-AFS4	8	0V	0V
3	0V	0V	9	Input aux. Feeding Rear S4-C1-1	IN2-12
4	EARTH	Earth	10	Input aux. Feeding Rear S4-C1-2	IN2-13
5	0V	0V	11	Output aux. Feeding Rear S4-C1-1	OUT2-12
6	44V	44V-AFS4	12	Output aux. Feeding Rear S4-C1-2	OUT2-13
IBB.X23 Aux feeding S4C2					
1	24V	24V-AFS4	7	0V	0V
2	44V-ES	44V-ES-AFS4	8	0V	0V
3	0V	0V	9	Input aux. Feeding Rear S4-C2-1	IN2-14
4	EARTH	Earth	10	Input aux. Feeding Rear S4-C2-2	IN2-15
5	0V	0V	11	Output aux. Feeding Rear S4-C2-1	OUT2-14
6	44V	44V-AFS4	12	Output aux. Feeding Rear S4-C2-2	OUT2-15
IBB.X24 Trolleylift 1 CAN					
1	0V	0V-Bitbus1	9	0V	0V
2	N.C.	N.C.	10	N.C.	N.C.
3	CAN-L	CAN-L1	11	CAN-H	CAN-H1
4	CAN-L	CAN-L2	12	CAN-H	CAN-H2
5	CAN-GND	CAN-GND	13	V+ (24V from lift)	N.C.
6	N.C.	N.C.	14	Feeder ready section 1	IN1-8
7	TRAD1 (Trolley Address)	0V-Bitbus1	15	TRAD2 (Trolley Address)	0V-Bitbus1
8	TRAD3 (Trolley Address)	0V-Bitbus1			
IBB.X25 Trolleylift 1 ES					
1	Switch3	24V-IO	4	Switch3	IN1-12
2	Switch1	ES1-7	5	N.C.	N.C.
3	Switch1	ES1-8	6	N.C.	N.C.
IBB.X26 Trolleylift 1 Bitbus					
1		0V	9	BBA-OUT	BBA3
2	BBA-IN	BBA2	10	BBB-OUT	BBB3
3	BBB-IN	BBB2	11		N.C.
4		0V	12		N.C.
5		N.C.	13		N.C.
6		N.C.	14		N.C.
7		N.C.	15	OUT1-4	trolley exchange
8		N.C.			

Pins	Description	Netname	Pins	Description	Netname
IBB.X27 Trolleylift 1 44V-ES					
1	44V-ES	44V-ES-LU1	4	N.C.	N.C.
2	N.C.	N.C.	5	N.C.	N.C.
3	OV	OV	6	N.C.	N.C.
IBB.X28 Trolleylift 2 CAN					
1	OV	OV-Bitbus2	9	OV	OV
2	N.C.	N.C.	10	N.C.	N.C.
3	CAN-L	CAN-L2	11	CAN-H	CAN-H2
4	CAN-L	CAN-L3	12	CAN-H	CAN-H3
5	CAN-GND	CAN-GND	13	V+ (24V from lift)	N.C.
6	N.C.	N.C.	14	Feeder ready section 2	IN1-9
7	TRAD1 (Trolley Address)	N.C.	15	TRAD2 (Trolley Address)	OV-Bitbus2
8	TRAD3 (Trolley Address)	OV-Bitbus2			
IBB.X29 Trolleylift 2 ES					
1	Switch3	24V-IO	4	Switch3	IN1-13
2	Switch1	ES1-8	5	N.C.	N.C.
3	Switch1	ES1-9	6	N.C.	N.C.
IBB.X30 Trolleylift 2 Bitbus					
1		OV	9	BBA-OUT	BBA4
2	BBA-IN	BBA3	10	BBB-OUT	BBB4
3	BBB-IN	BBB3	11		N.C.
4		OV	12		N.C.
5		N.C.	13		N.C.
6		N.C.	14		N.C.
7		N.C.	15	OUT1-4	trolley exch.
8		N.C.			
IBB.X31 Trolleylift 2 44V-ES					
1	44V-ES	44V-ES-LU1	4	N.C.	N.C.
2	N.C.	N.C.	5	N.C.	N.C.
3	OV	OV	6	N.C.	N.C.
IBB.X32 Trolleylift 3 CAN					
1	OV	OV-Bitbus3	9	OV	OV
2	N.C.	N.C.	10	N.C.	N.C.
3	CAN-L	CAN-L3	11	CAN-H	CAN-H3
4	CAN-L	CAN-L4	12	CAN-H	CAN-H4
5	CAN-GND	CAN-GND	13	V+ (24V from lift)	N.C.
6	N.C.	N.C.	14	Feeder ready section 3	IN1-10
7	TRAD1 (Trolley Address)	OV-Bitbus3	15	TRAD2 (Trolley Address)	N.C.
8	TRAD3 (Trolley Address)	OV-Bitbus3			
IBB.X33 Trolleylift 3 ES					
1	Switch3	24V-IO	4	Switch3	IN1-14
2	Switch1	ES1-9	5	N.C.	N.C.
3	Switch1	ES1-10	6	N.C.	N.C.
IBB.X34 Trolleylift 3 Bitbus					
1		OV	9	BBA-OUT	BBA5
2	BBA-IN	BBA4	10	BBB-OUT	BBB5
3	BBB-IN	BBB4	11		N.C.
4		OV	12		N.C.
5		N.C.	13		N.C.
6		N.C.	14		N.C.
7		N.C.	15	OUT1-4	trolley exch.
8		N.C.			
IBB.X35 Trolleylift 3 44V-ES					
1	44V-ES	44V-ES-LU1	4	N.C.	N.C.

Pins	Description	Netname	Pins	Description	Netname
2	N.C.	N.C.	5	N.C.	N.C.
3	0V	0V	6	N.C.	N.C.
IBB.X36 Trolleylift 4 CAN					
1	0V	0V-Bitbus4	9	0V	0V
2	N.C.	N.C.	10	N.C.	N.C.
3	CAN-L	CAN-L4	11	CAN-H	CAN-H4
4	CAN-L	N.C.	12	CAN-H	N.C.
5	CAN-GND	CAN-GND	13	V+ (24V from lift)	N.C.
6	N.C.	N.C.	14	Feeder ready section 4	IN1-11
7	TRAD1 (Trolley Address)	N.C.	15	TRAD2 (Trolley Address)	N.C.
8	TRAD3 (Trolley Address)	0V-Bitbus4			
IBB.X37 Trolleylift 4 ES					
1	Switch3	24V-IO	4	Switch3	IN1-15
2	Switch1	ES1-10	5	N.C.	N.C.
3	Switch1	ES1-11	6	N.C.	N.C.
IBB.X38 Trolleylift 4 Bitbus					
1		0V	9	BBA-OUT	N.C.
2	BBA-IN	BBA5	10	BBB-OUT	N.C.
3	BBB-IN	BBB5	11		N.C.
4		0V	12		N.C.
5		N.C.	13		N.C.
6		N.C.	14		N.C.
7		N.C.	15	OUT1-4	trolley exch.
8		N.C.			
IBB.X39 Trolleylift 4 44V-ES					
1	44V-ES	44V-ES-LU1	4	N.C.	N.C.
2	N.C.	N.C.	5	N.C.	N.C.
3	0V	0V	6	N.C.	N.C.
IBB.X40 24V Supply CA Front					
1	24V	24V-CAM	3	0V	0V
2	N.C.	N.C.			
IBB.X41 24V Supply CA Rear					
1	24V	24V-CAM	3	0V	0V
2	N.C.	N.C.			
IBB.X42 24V Supply BA1&2					
1	24V	24V-BA	3	0V	0V
2	N.C.	N.C.			
IBB.X43 Trigger CA Front					
1	Trig+	Trigger+CAF	3	Shield	Earth
2	Trig-	Trigger-CAF	4	N.C.	N.C.
IBB.X44 Trigger CA Rear					
1	Trig+	Trigger+CAR	3	Shield	Earth
2	Trig-	Trigger-CAR	4	N.C.	N.C.
IBB.X45 Trigger BA1&2					
1		N.C.	11	shield	Earth
2		N.C.	12	trigger1-	Trigger- BAF
3		N.C.	13	trigger1+	Trigger+B AF
4		N.C.	14	shield	Earth
5		N.C.	15	shield	Earth
6		N.C.	16	trigger2-	Trigger- BAR
7		N.C.	17	trigger2+	Trigger+B AR
8		N.C.	18	shield	Earth

Pins	Description	Netname	Pins	Description	Netname
9		N.C.	19		N.C.
10		N.C.	20		N.C.
IBB.X46	LPT1 Controller				
1		N.C.	14		N.C.
2	T1-	T1-	15		N.C.
3	T1+	T1+	16		N.C.
4	T2-	T2-	17		N.C.
5	T2+	T2+	18		GND
6	T4-	T4-	19		GND
7	T4+	T4+	20		GND
8	T3-	T3-	21		GND
9	T3+	T3+	22		GND
10		N.C.	23		GND
11		GND	24		GND
12		GND	25		GND
13		N.C.			
IBB.X47	CAN from SVS controller				
1	N.C.	N.C.	6	N.C.	N.C.
2	CAN-H	CAN-H1	7	CAN-L	CAN-L1
3	CAN-GND	CAN-GND	8	N.C.	N.C.
4	N.C.	N.C.	9	N.C.	N.C.
5	N.C.	N.C.			
IBB.X48	Bitbus in from IBE				
1		N.C.	9		N.C.
2	shield	Earth	10		N.C.
3	BBB	BBB2	11		N.C.
4		0V	12		N.C.
5	Bitbus nodes OK	IN1-2	13		N.C.
6	QuickStop-BB	OUT1-5	14		N.C.
7		N.C.	15		N.C.
8	BBA	BBA2			
IBB.X49	Verification Tool				
1	N.C.	N.C.	6	Valve4	OUT1-11
2	0V	0V	7	N.C.	N.C.
3	Valve1	OUT1-8	8	N.C.	N.C.
4	Valve2	OUT1-9	9	N.C.	N.C.
5	Valve3	OUT1-10			
IBB.X50	to E-stop relay				
1	S11	ES1-14	6	contact PNOZ	24V-IO
2	S21	ES2-7	7	contact relay	ES-SP1
3	S22	ES2-1	8	contact relay	ES-SP2
4	S12	ES1-1	9	N.C.	N.C.
5	contact PNOZ	IN1-3			
IBB.X51	Blower CA front/rear				
1	Valve1	OUT1-6	4	N.C.	N.C.
2	Valve2	OUT1-7	5	N.C.	N.C.
3	Common	0V	6	N.C.	N.C.
IBB.X52	24V supply IO				
1	24V	24V-IO	3	0V	0V
2	N.C.	N.C.			
IBB.X53	16 Input Module 3				
1	IN3-0	IN3-0	11	IN3-10	IN3-10
2	IN3-1	IN3-1	12	IN3-11	IN3-11
3	IN3-2	IN3-2	13	IN3-12	IN3-12
4	IN3-3	IN3-3	14	IN3-13	IN3-13
5	IN3-4	IN3-4	15	IN3-14	IN3-14

Pins	Description	Netname	Pins	Description	Netname
6	IN3-5	IN3-5	16	IN3-15	IN3-15
7	IN3-6	IN3-6	17	0V	0V
8	IN3-7	IN3-7	18	0V	0V
9	IN3-8	IN3-8	19	24V	N.C.
10	IN3-9	IN3-9	20	24V	N.C.
IBB.X54 ES Spare					
1	Detection	24V-IO	4	Detection	IN3-2
2	Input	ES1-13	5	N.C.	N.C.
3	Input	ES1-14	6	N.C.	N.C.
IBB.X55 ES Enabling Switch Front					
1	N.C.	N.C.	4	N.C.	N.C.
2	Switch1	ES1-1	5	Switch2	ES2-1
3	Switch1	ES1-3	6	Switch2	ES2-3
IBB.X56 ES Enabling Switch Front Left					
1	N.C.	24V-IO	4	N.C.	IN1-6
2	Switch1	ES1-1	5	Switch2	ES2-1
3	Switch1	ES1-2	6	Switch2	ES2-2
IBB.X57 ES Cover Rear Left					
1	Switch3	24V-IO	4	Switch3	IN1-7
2	Switch1	ES1-3	5	Switch2	ES2-3
3	Switch1	ES1-4	6	Switch2	ES2-4
IBB.X58 Enabling Switch Rear					
1	Switch3	N.C.	4	Switch3	IN3-1
2	Switch1	ES1-3	5	Switch2	ES2-3
3	Switch1	ES1-5	6	Switch2	ES2-5
IBB.X59 ES to XY controller					
1	N.C	N.C	3	0V	0V
2	E-stop	IN1-3R			
IBB.X60 Fluxer					
1	24V	24V- FLUX	6	GND	0V
2	Fluxer ready	IN3-6	7	Fluxer claimed	OUT1-12
3	GND	0V	8	N.C.	N.C.
4	24V	24V-FLUX	9	GND	0V
5	Fluxer cover placed	IN3-7	-		

B5.3.13.1 Auxiliary feeding, connectors

- Connectors are connected to IBB, see [B5.3.12 Interconnection board base, connections](#), connectors X16 to X23
- Fuses of the connectors, see [B5.3.11 Interconnection board base, fuses and LED signalling](#), fuse F103 to F114

Pin	Description
A	44V-ES
B	Not connected
C	Output aux. feeding
D	Input aux. feeding
E	Input aux. feeding
F	0V
G	Not connected
H	0V
J	24V
K	EARTH
L	44V
M	0V
N	0V
O	Output aux. feeding

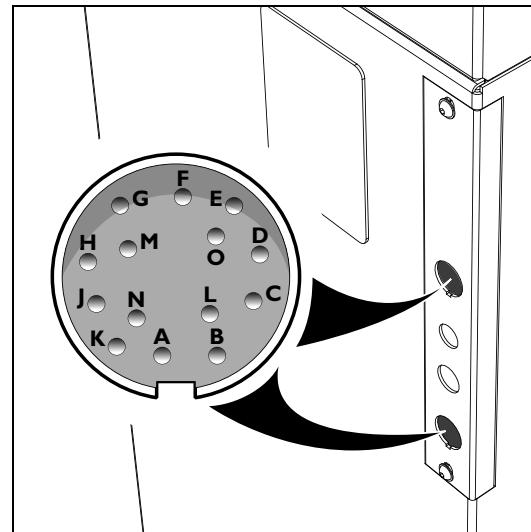


Figure 75 Auxiliary feeding, connector

B5.3.14 Interconnection board electrics, fuses and LED signalling

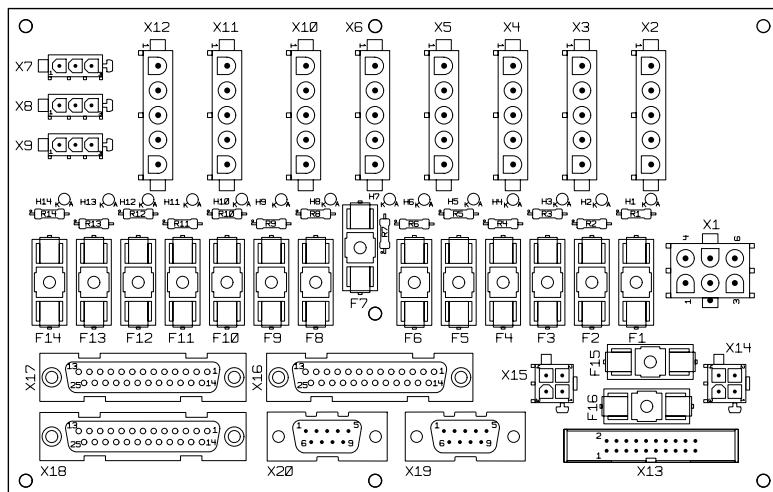


Figure 76 Interconnection board electrics

No.	Fuse		No.	LED
F1	4AT	24V supply HA head drive 1	H1	green
F2	4AT	44V-ES supply HA head drive 1	H2	green
F3	4AT	24V supply HA head drive 2	H3	green
F4	4AT	44V-ES supply HA head drive 2	H4	green
F5	4AT	24V supply Transport Controller	H5	green
F6	4AT	44V-ES supply Transport Controller	H6	green
F7	4AT	24V supply Transport Controller Piggyback	H7	green
F8	4AT	24V supply transport amplifier	H8	green
F9	4AT	44V-ES supply transport amplifier	H9	green
F10	4AT	24V supply head drive 1&2(3)	H10	green
F11	4AT	44V-ESV supply head drive 1	H11	green
F12	4AT	Fuse 44V-ESV supply head drive 2	H12	green
F13	4AT	Spare (44V-ESV supply head drive 3)	H13	green
F14	4AT	24V logic supply Y1+Y2+X	H14	green
F15	4AT	Z-axis HA Head 1	-	-
F16	4AT	Z-axis HA Head 2	-	-

Figure 77 Interconnection board electrics, fuses and LED signalling

B5.3.15 Interconnection board electrics, connections

Board lay out, see [Figure 76. Interconnection board electrics](#)

	Function		Function
X1	Supply in 24V/44V	X11	Supply head drive 2
X2	Supply Head Controller 1	X12	Supply head drive 3
X3	Supply Head Controller 1	X13	Z motor head 1&2
X4	Supply Head Transport Controller	X14	Z drive head 1
X5	Supply Head Transport Controller Piggyback	X15	Z drive head 2
X6	Supply DCPA	X16	Bitbus head Controller 1
X7	Logic supply servo XY-robot Y1	X17	Bitbus head Controller 2
X8	Logic supply servo XY-robot Y2	X18	Bitbus Transport Controller
X9	Logic supply servo XY-robot X	X19	Bitbus to Interconnection board 1
X10	Supply head drive 1	X20	Bitbus from Computer

Figure 78 Interconnection board electrics, connections

B5.3.16 Interconnection board electrics, signals

Board lay out, see [Figure 76. Interconnection board electrics](#)

Pins	Description	Netname	Pins	Description	Netname
IBE.X1	Supply in				
1	24V	24V	4	EARTH	Earth
2	44V-ES	44V-ES	5	0V	0V
3	0V	0V	6	44V	N.C.
IBE.X2	Supply Head Controller 1				
1	24V	24V-F1	4	EARTH	Earth
2	44V-ES	44V-ES-F2	5	N.C.	N.C.
3	0V	0V			
IBE.X3	Supply Head Controller 2				
1	24V	24V-F3	4	EARTH	Earth
2	44V-ES	44V-ES-F4	5	N.C	N.C.
3	0V	0V			
IBE.X4	Supply Transport Controller				
1	24V	24V-F5	4	EARTH	Earth
2	44V-ES	44V-ES-F6	5	N.C	N.C.
3	0V	0V			
IBE.X5	Supply Piggyback Transport				
1	24V	24V-F7	4	EARTH	Earth
2	N.C	N.C.	5	N.C	N.C.
3	0V	0V			
IBE.X6	Supply DCPA				
1	24V	24V-F8	4	EARTH	Earth
2	N.C.	44V-ES-F9	5	N.C.	N.C.
3	0V	0V			
IBE.X7	logic supply servo XY-robot Y1				
1	24V	24V-F14	3	0V	0V
2	N.C.	N.C.			
IBE.X8	logic supply servo XY-robot Y2				
1	24V	24V-F14	3	0V	0V
2	N.C.	N.C.			
IBE.X9	logic supply servo XY-robot X				
1	24V	24V-F14	3	0V	0V
2	N.C.	N.C.			
IBE.X10	supply head drive 1				
1	24V	24V-F10	4	0V	Earth
2	44V-ES	44V-ES-F11	5	N.C.	0V
3	0V	0V			
IBE.X11	supply head drive 2				
1	24V	24V-F10	4	0V	Earth
2	44V-ES	44V-ES-F12	5	N.C	0V
3	0V	0V			
IBE.X12	supply head drive 3				
1	24V	24V-F10	4	0V	Earth
2	44V-ES	44V-ES-F13	5	N.C.	0V
3	0V	0V			
IBE.X13	Z motor head 1& 2				
1	N.C	N.C	11	Earth	Earth
2	N.C	N.C	12	Head1 Z+	Head1-Z+F15
3	N.C	N.C	13	Head1 Z+	Head1-Z+F15
4	Head2 Z-	Head2-Z-	14	Head1 Z+	Head1-Z+F15
5	Head2 Z-	Head2-Z-	15	Head1 Z-	Head1-Z-
6	Head2 Z-	Head2-Z-	16	Head1 Z-	Head1-Z-
7	Head2 Z+	Head2-Z+F16	17	Head1 Z-	Head1-Z-

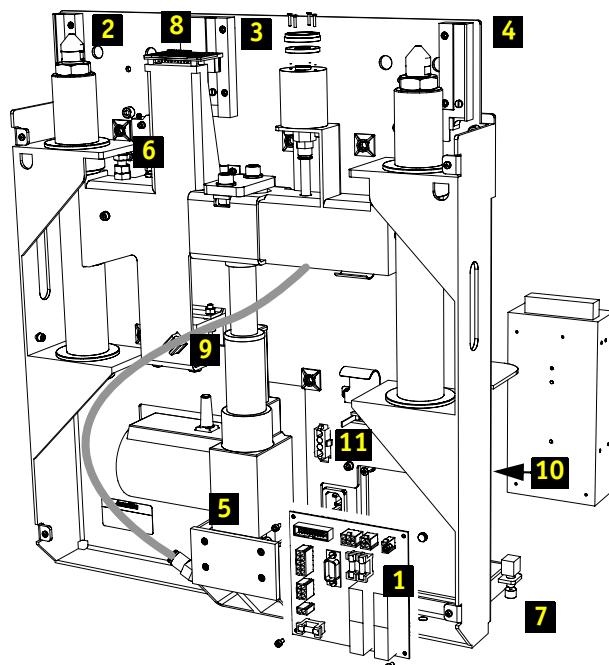
Pins	Description	Netname	Pins	Description	Netname
8	Head2 Z+	Head2-Z+F16	18	N.C	N.C
9	Head2 Z+	Head2-Z+F16	19	N.C	N.C
10	Earth	Earth	20	N.C	N.C
IBE.X14	Z motor head 1				
1	Head1 Z+	Head1-Z+	3	Earth	Earth
2	Head1 Z-	Head1-Z-	4	Earth	Earth
IBE.X15	Z motor head 2				
1	Head2 Z+	Head2-Z+	3	Earth	Earth
2	Head2 Z-	Head2-Z-	4	Earth	Earth
IBE.X16	Bitbus Head Controller 1				
1	OV	Earth	14	N.C.	N.C.
2	BBA	BBA	15	PCC	N.C.
3	BBB	BBB	16	PCE	N.C.
4	OV	OV	17	TCA	QuickStop-BB
5	NA00	N.C.	18	TCK	OV
6	NA01	OV	19	OV	OV
7	NA02	OV	20	24V	N.C.
8	NA03	OV	21	ATC	BB-Nodes-OK
9	NA04	OV	22	ATE	0v
10	NA05	OV	23	ATT	N.C.
11	NA06	OV	24	ATT	N.C.
12	NA07	OV	25	RESX	N.C.
13	OV	OV			
IBE.X17	Bitbus Head Controller 2				
1	OV	Earth	14	N.C.	N.C.
2	BBA	BBA	15	PCC	N.C.
3	BBB	BBB	16	PCE	N.C.
4	OV	OV	17	TCA	QuickStop-BB
5	NA00	OV	18	TCK	OV
6	NA01	N.C.	19	OV	OV
7	NA02	OV	20	24V	N.C.
8	NA03	OV	21	ATC	BB-Nodes-OK
9	NA04	OV	22	ATE	0V
10	NA05	OV	23	ATT	N.C.
11	NA06	OV	24	ATT	N.C.
12	NA07	OV	25	RESX	N.C.
13	OV	OV			
IBE.X18	Bitbus Transport Controller				
1	OV	Earth	14	N.C.	N.C.
2	BBA	BBA	15	PCC	N.C.
3	BBB	BBB	16	PCE	N.C.
4	OV	OV	17	TCA	QuickStop-BB
5	NA00	OV	18	TCK	OV
6	NA01	OV	19	OV	OV
7	NA02	OV	20	24V	N.C.
8	NA03	OV	21	ATC	BB-Nodes-OK
9	NA04	N.C.	22	ATE	0V
10	NA05	OV	23	ATT	N.C.
11	NA06	OV	24	ATT	N.C.
12	NA07	OV	25	RESX	N.C.
13	OV	OV			
IBE.X19	Bitbus to IBB				
1	N.C	N.C.	6	QuickStop-BB	QuickStop-BB
2	OV (shield)	Earth	7	N.C	N.C
3	BBB	BBB	8	BBA	BBA
4	N.C	N.C.	9	N.C	N.C

Pins	Description	Netname	Pins	Description	Netname
5	Bitbus nodes OK	BB-Nodes-OK			
IBE.X20	Bitbus from Computer				
1	N.C	N.C.	6	N.C	N.C.
2	OV (shield)	Earth	7	N.C	N.C.
3	BBB	BBB	8	BBA	BBA
4	N.C	N.C.	9	N.C	N.C.
5	N.C	N.C.			

B5.3.17 Trolley lift, features

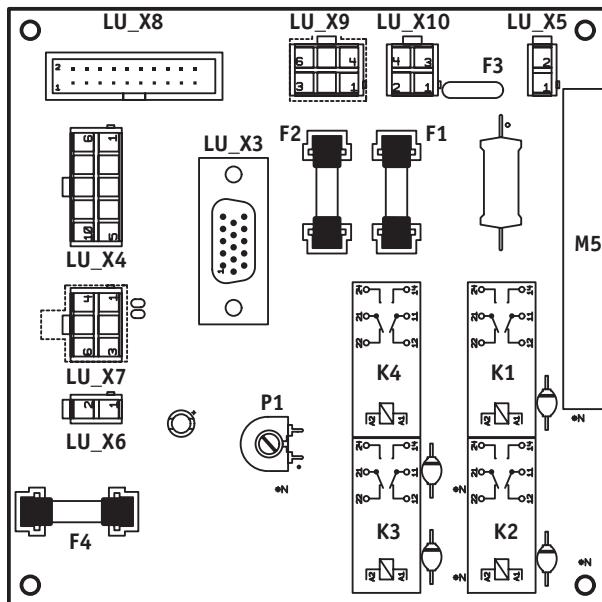
For the location of the items refer to the wiring diagram [B5.4.1. Trolley lift, diagram](#).

Extra information about the trolley lift controller (1), see [B5.3.17.1](#).



Item	Function	Remarks
1	Trolley lift controller	
2	Trolley 'UP' contact area	
3	Trolley 'DOWN' contact area	
4	Common trolley contact area	
5	Actuator	
6	Micro switch	
7	Service switch	Enables to remove the trolley from the trolley lift when the trolley lift does not respond to the 'down' control on the trolley.
8	Base interface board	
9	Safety interlock	The safety interlock on the trolley lift is part of the safety circuit.
10	230 VAC - 24 VDC power converter	
11	Safety circuit connection	LU-X2

B5.3.17.1 Trolley lift controller



Item	Function
K1	Activates the actuator to move upward
K2	Activates the actuator to move downward
K3	Holds the trolley lift in the same Z-position
K4	Closes the power circuit to the trolley (2 times 24 VDC)
F1	Protects the 24 V, 4 A power supply to the tape cutter (if applicable)
F2	Protects the 24 V, 4 A power supply to the feeders
F3	Self correcting poly fuse, protects the 24 VDC to the trolley lift
F4	Spare fuse

B5.4 Diagrams

B5.4.1 Trolley lift, diagram

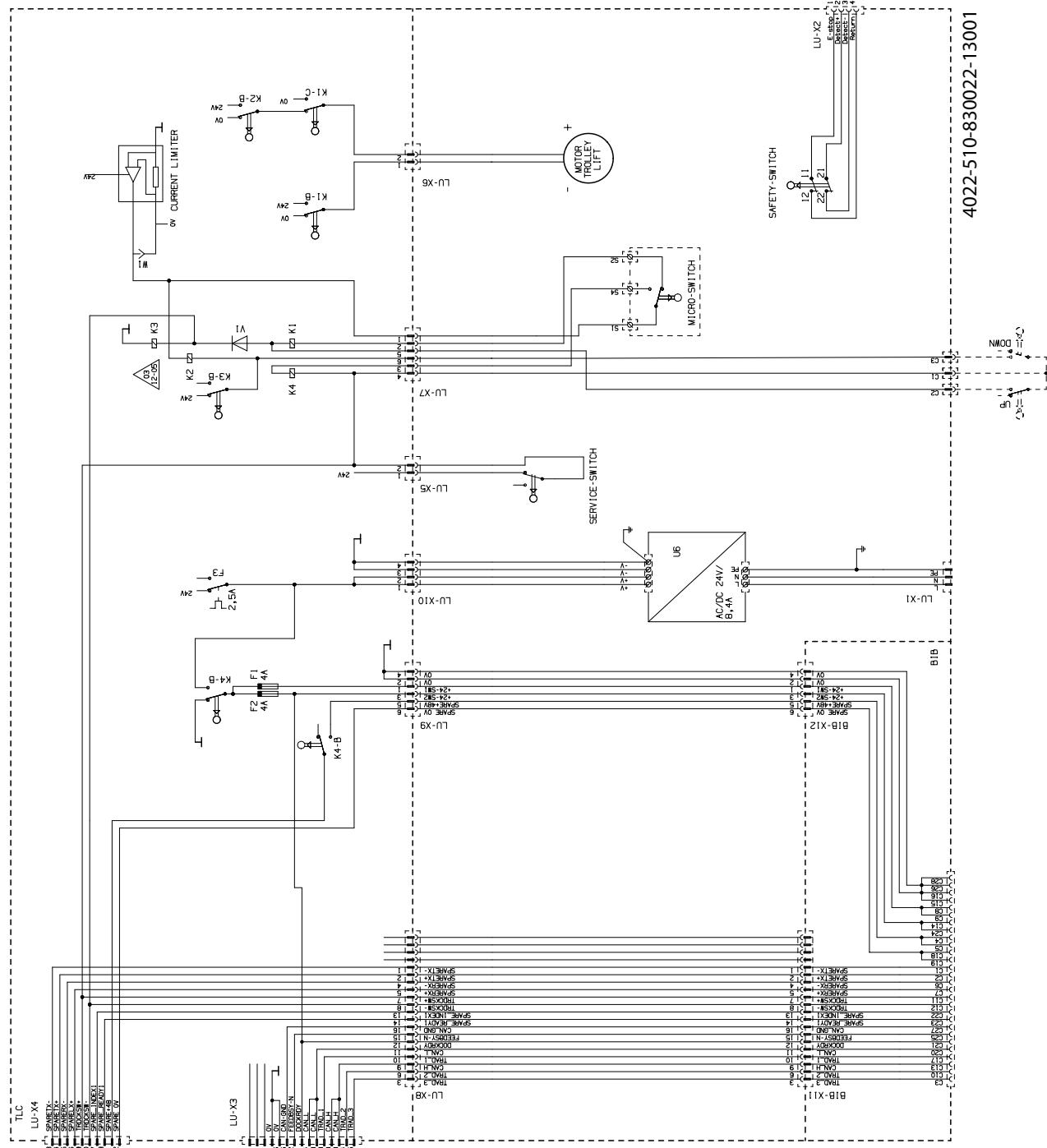


Figure 79 Trolley lift diagram

B5.4.2 Control supply unit PA 2410/01, diagram

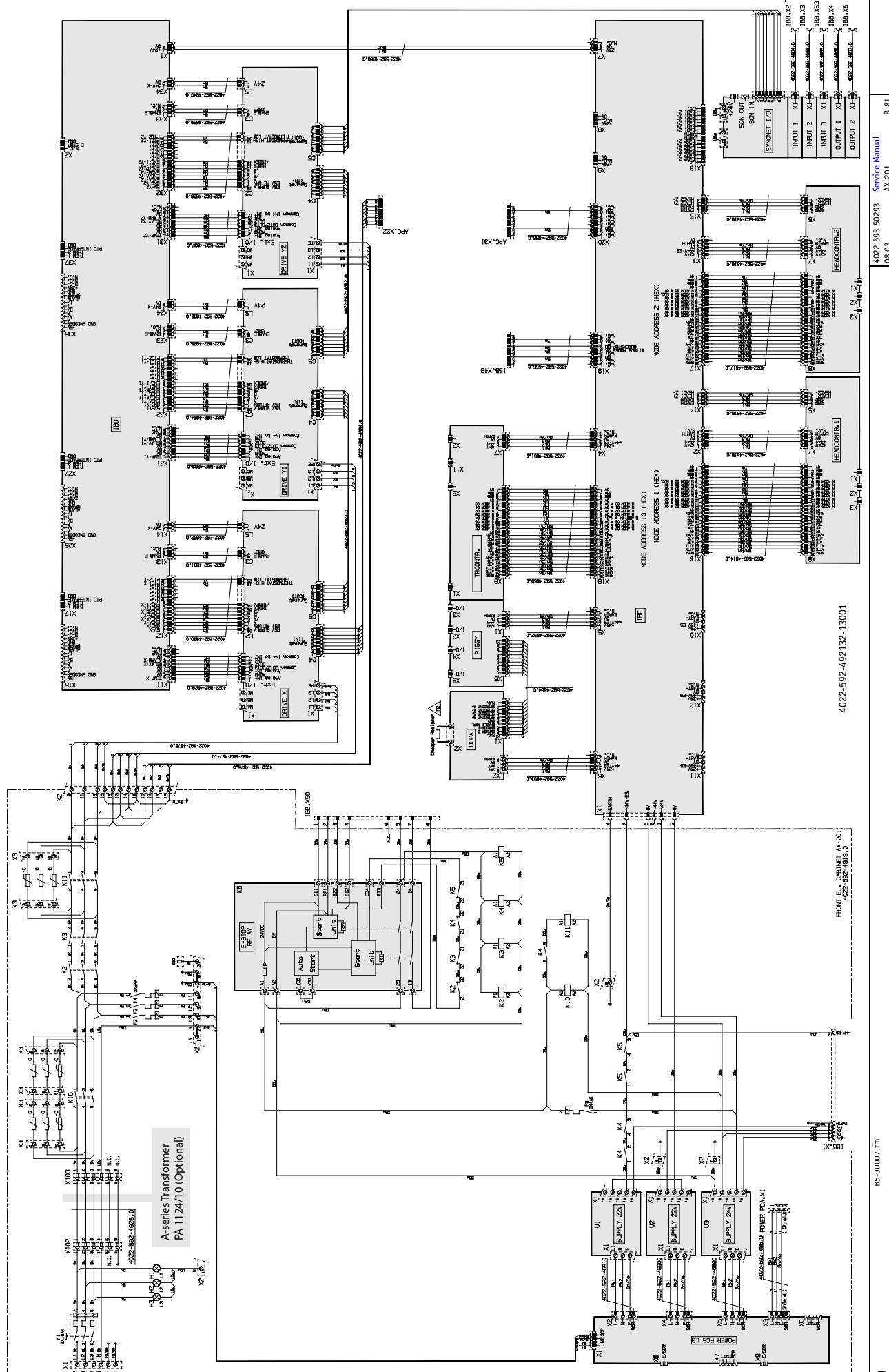


Figure 80 Control supply unit PA 2410/01, diagram

B5.4.3 Control supply unit PA 2410/00, diagram

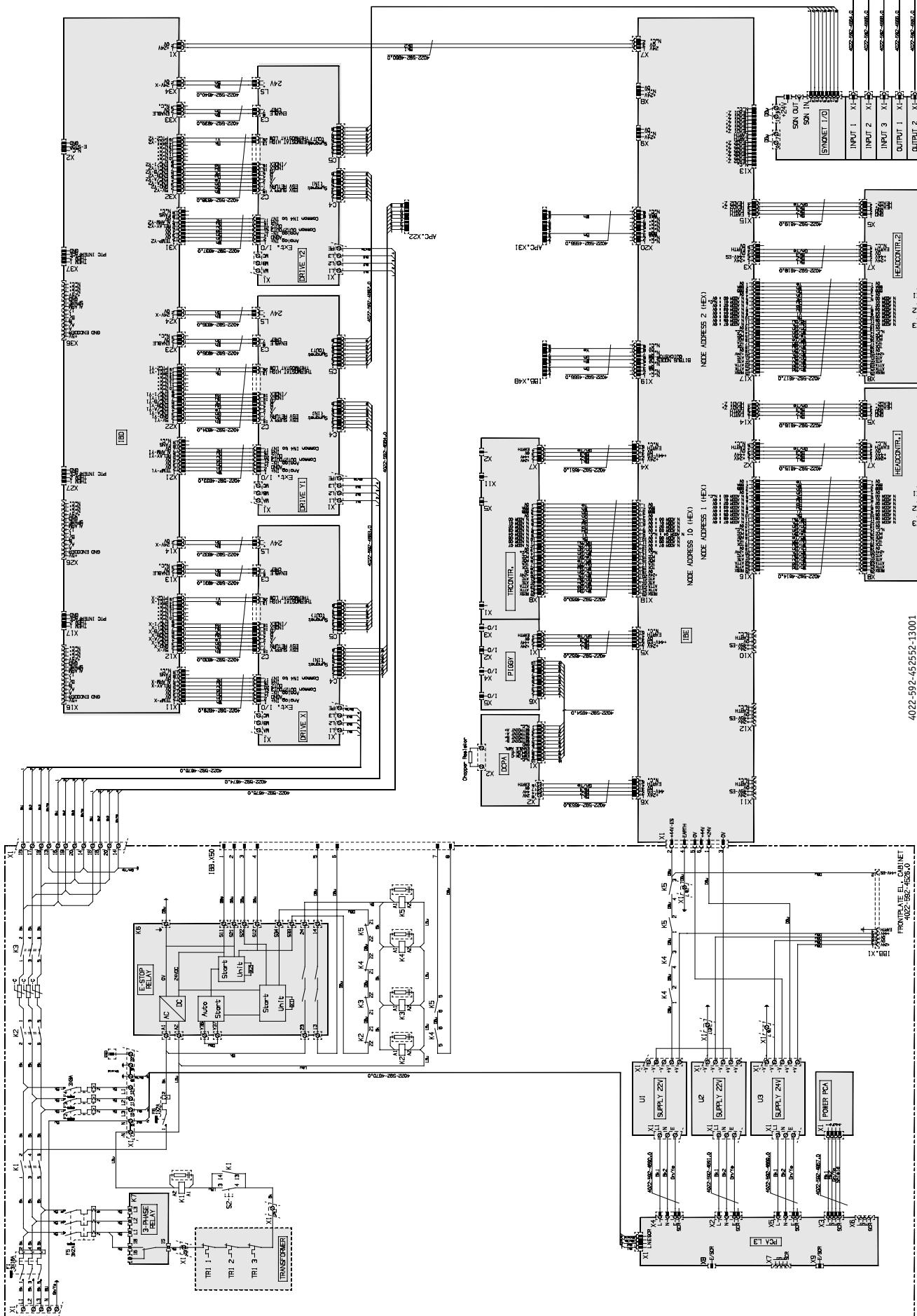


Figure 81 Control supply unit PA 2410/00, diagram

B5.4.4 A-series transformer PA 1124/10, diagram

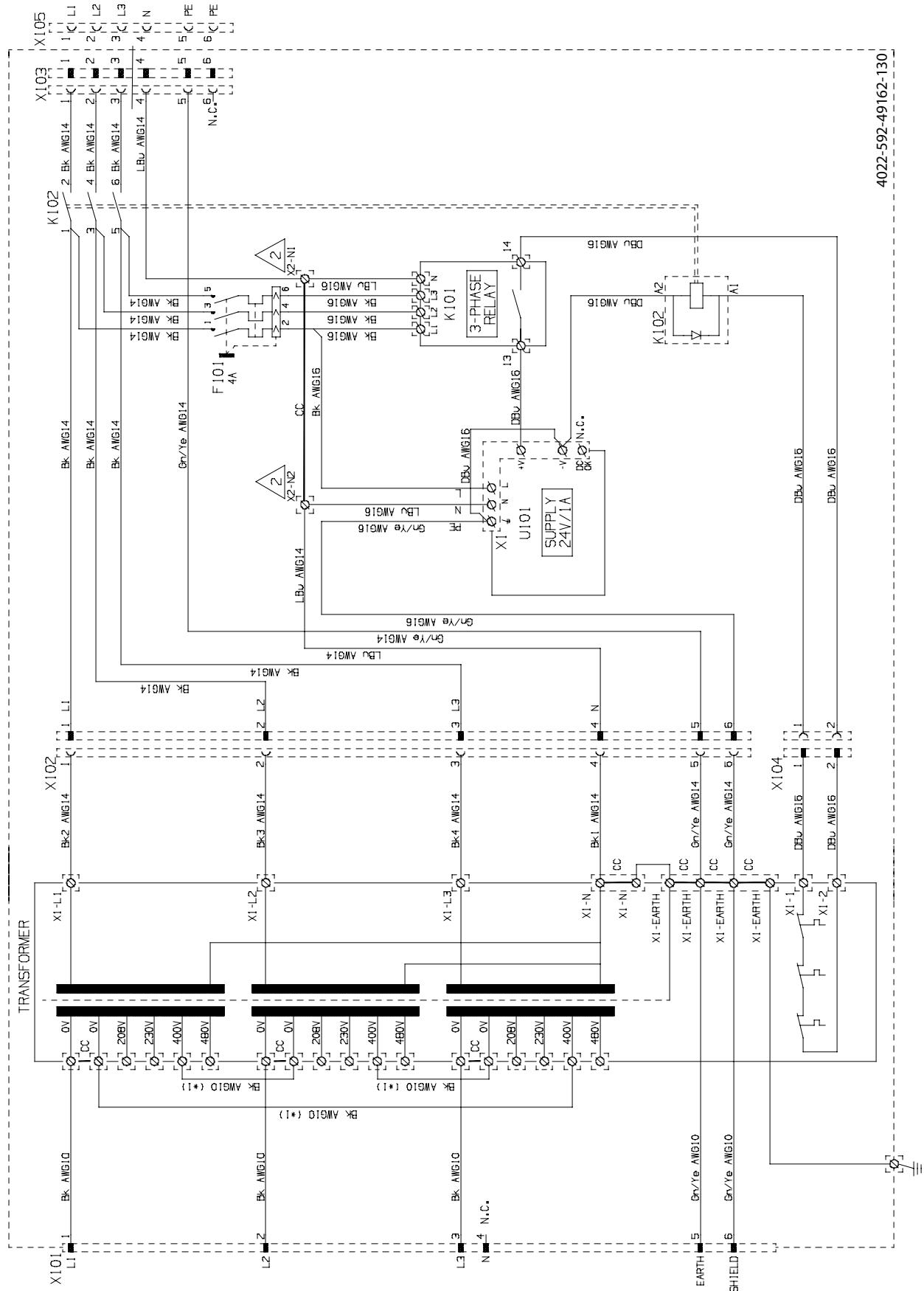


Figure 82 A-series transformer PA 1124/10, diagram

B5.4.5 Air and vacuum, diagram

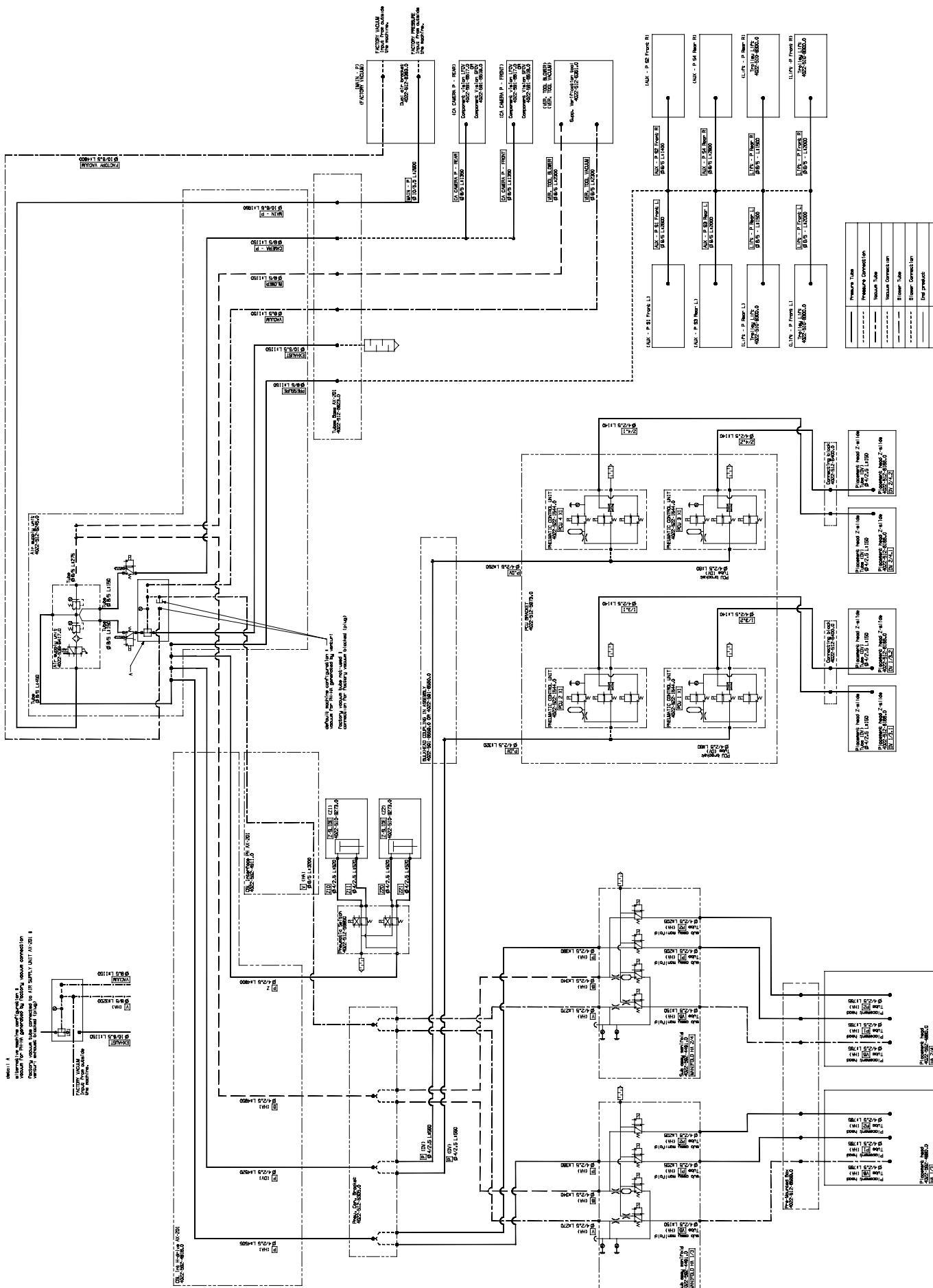


Figure 83 Air and vacuum diagram

C5.3 Reference information

C5.3.1 Transport controller, LED status check

This board is mounted in the control supply, see [B5.3.1 Control supply, lay-out](#)

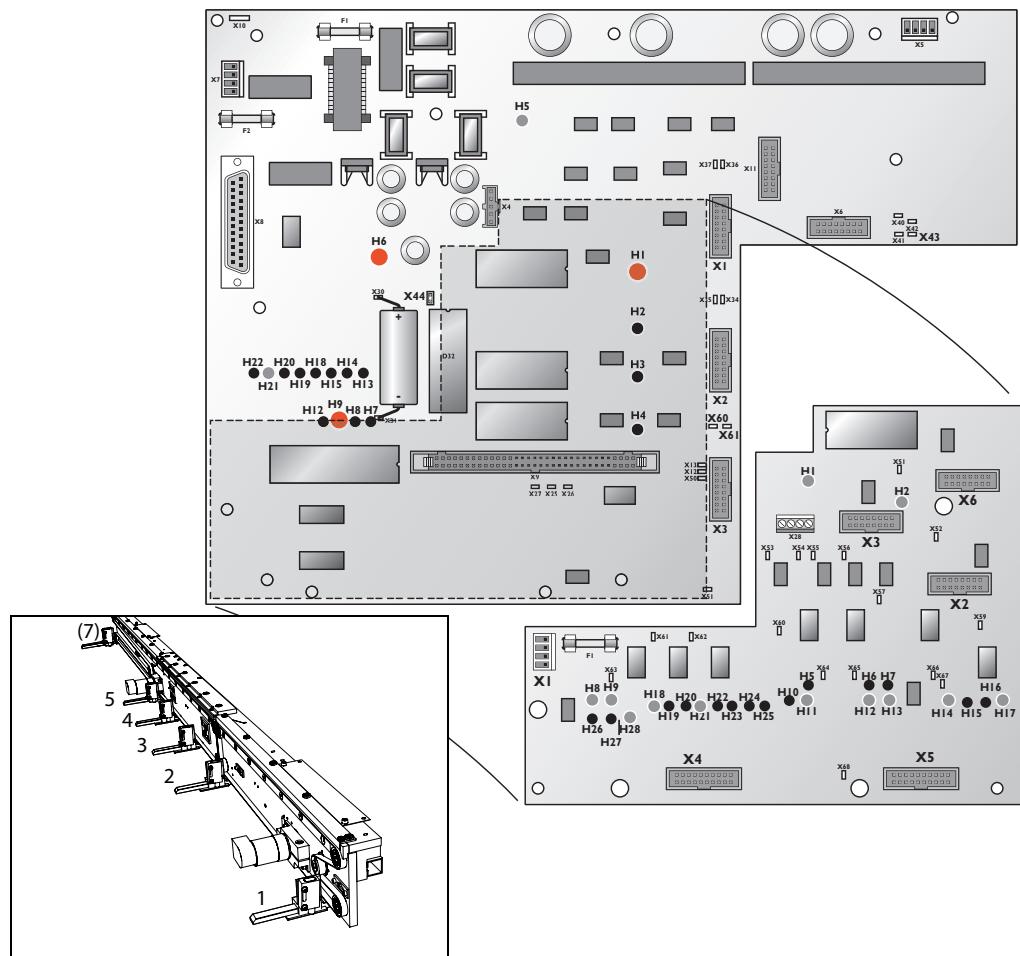


Figure 13 Transport controller, LED status and sensors on board transport

LED	ON/OFF	SYSTEM STATUS	LED	ON/OFF	SYSTEM STATUS
H1	ON	Index WA	H6	ON	Servo power OK (45V)
H2	ON/OFF	Index transport lift	H9	ON	Enable controller
H4	ON/OFF	Index RI	H21	ON/OFF	Enable amplifier WA and RI
H5	ON/OFF	24V supply < 16V (power failure)			
Piggy back					
H1	ON	Enable servo power on	H13	ON	Board sensor, WA-IN (3)
H2	ON	Index Width	H14	ON	Z brake
H7	ON	Board sensor, run-out OUT (7)	H17	ON	SMEMA board available
H8	ON	Board sensor, run-in OUT (2)	H18	ON	SMEMA busy
H9	ON	SMEMA previous machine board available	H21	ON	Width brake
H11	ON	SMEMA next machine busy	H28	ON	Board sensor, run-in IN (1)
H12	ON	Board sensor, WA-POS (5)	No LED		Board sensor, WA-LOW (4)

Figure 14 Transport controller, LED status

C5.3.1.1 Transport controller, connections and fuses

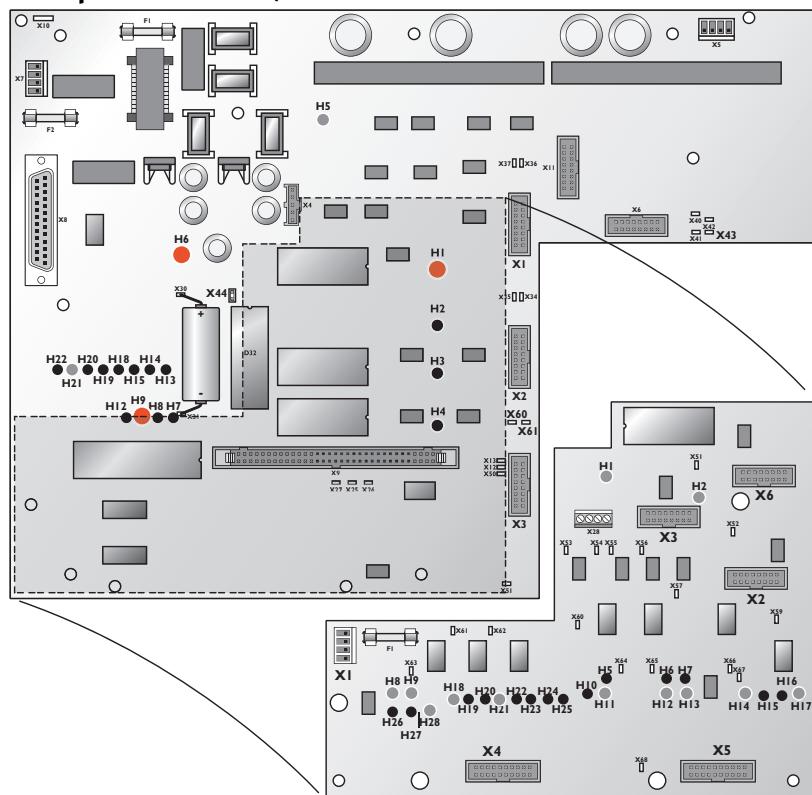


Figure 15 Transport controller, connections and fuses

IDENT	STATUS	FUNCTION
X2	Connector	Servo RI
X5	Connector	Motor WA
X6	Connector	LED Panel
X7	Connector	Power input
X8	Connector	Bitbus communication
X10	Connector	Cabinet ground
X11	Connector	Encoder hoist
X30	Connection	Battery +ve
X31	Connection	Battery -ve
X43	Test point	Monitor ground
X44	Jumper	Enable write EPROM
X60	Test point	Monitor out
X61	Test point	Monitor ground
F1	Fuse	Slow 250V/4A 45V
F2	Fuse	Slow 250V/2A 24V
Piggy back		
X1	Connector	Power input
X2	Connector	Encoder WA
X3	Connector	Encoder width
X4	Connector	I/O left
X5	Connector	I/O right
X6	Connector	Transport amplifier
F1	Fuse	Slow 250V/2A

Figure 16 Transport controller, connections and fuses

C5.3.1.2 Transport amplifier, LED status

This amplifier is mounted in the control supply, see [B5.3.1 Control supply, lay-out](#)

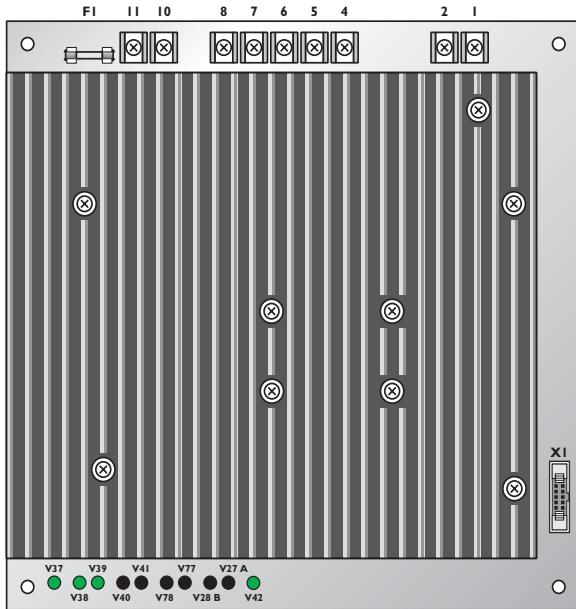


Figure 17 Transport amplifier

LED	ON/OFF	SYSTEM STATUS
V27	OFF	IARMS (RMS over-current protection amplifier A) no error
V77	OFF	IBRMS (RMS over-current protection amplifier B) no error
V28	OFF	IAPEAK (peak current protection amplifier A) no error
V78	OFF	IBPEAK (peak current protection amplifier B) no error
V37	ON	CHOPON (chopper transistor operation)
V38	ON	ENABLE (no error signals)
V39	ON	HSPOK (board in position front)
V40	OFF	OHSPS (over voltage protection of HPS) no error
V41	OFF	HSTEMP (heatsink temperature) no error
V42	ON	LSPSOK (low voltage power supply) no error

Figure 18 Transport amplifier, LED status

C5.3.1.3 Transport amplifier, connections

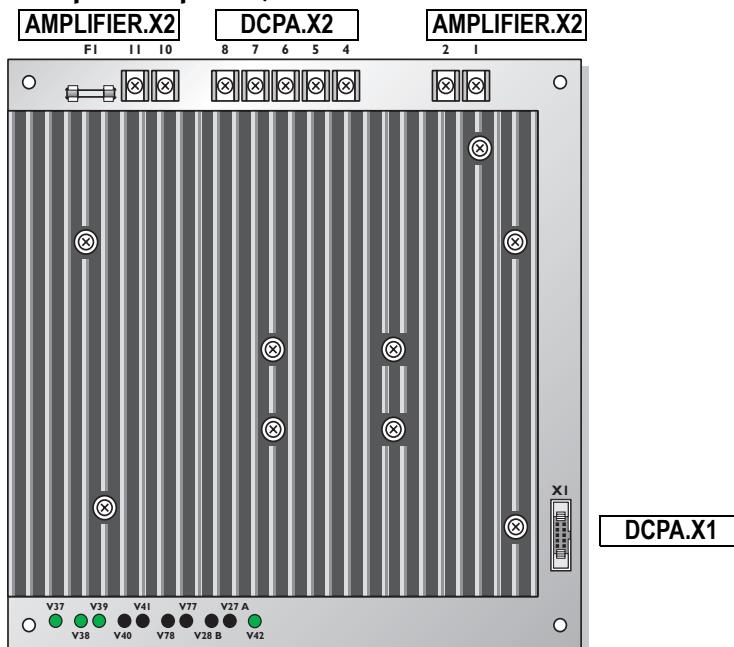


Figure 19 Transport amplifier

ID	STATUS	FUNCTION
AMPLIFIER.X2-1	Connection	Z motor +
AMPLIFIER.X2-2	Connection	Z motor -
DCPA.X2-4	Connection	+ 45 V
5	Connection	Ballast Limms
DCPA.X2-6	Connection	0 V
DCPA.X2-7	Connection	0 V
DCPA.X2-8	Connection	+ 24 V
AMPLIFIER.X2-10	Connection	Width adjust motor -
AMPLIFIER.X2-11	Connection	Width adjust motor +
DCPA.X1	Connector	To transport controller
F1	Fuse	Slow 2A

Figure 20 Transport amplifier, connections

C5.3.2 Board sensors, LED signalling

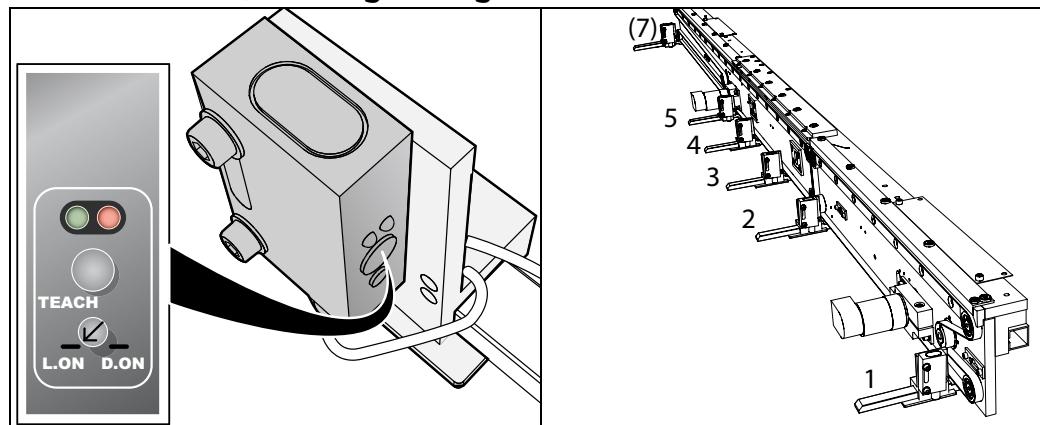


Figure 21 Board sensors, LED signalling

Meaning of the LED's:		
ORANGE LED = ON means object detected		
GREEN LED= ON means stable detection of presence/absence of the object.		
ORANGE LED	GREEN LED	
ON	ON	Object properly detected
OFF	ON	Object properly absent
ON	OFF	Object detected (poor detection)
OFF	OFF	NO object detected (poor detection)

Figure 22 Board sensors, LED signalling

C5.4 Board transport, diagrams

C5.4.1 Transport controller, electrical diagram

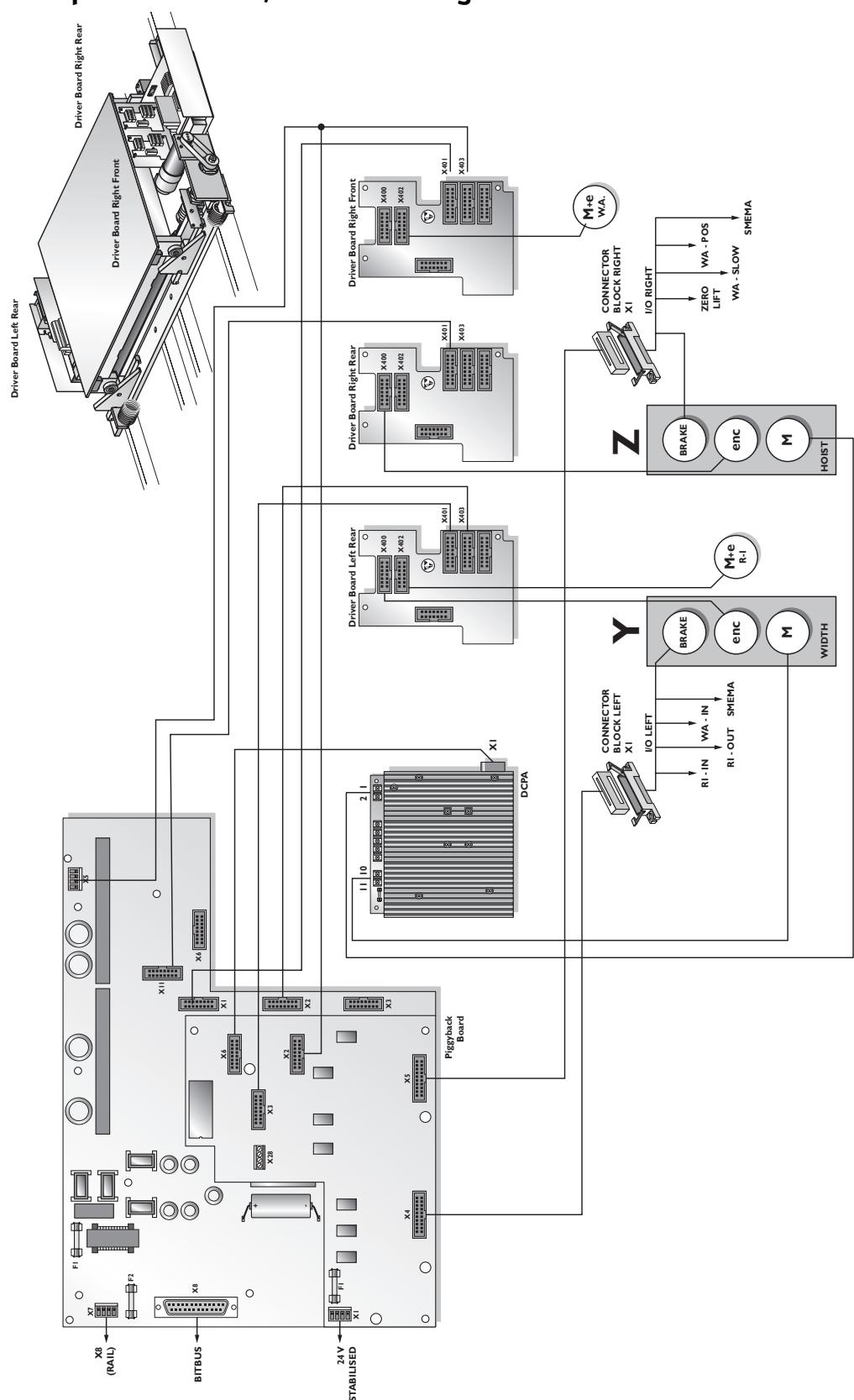


Figure 23 Transport controller, electrical diagram

C5.4.2 Transport width motor, diagram

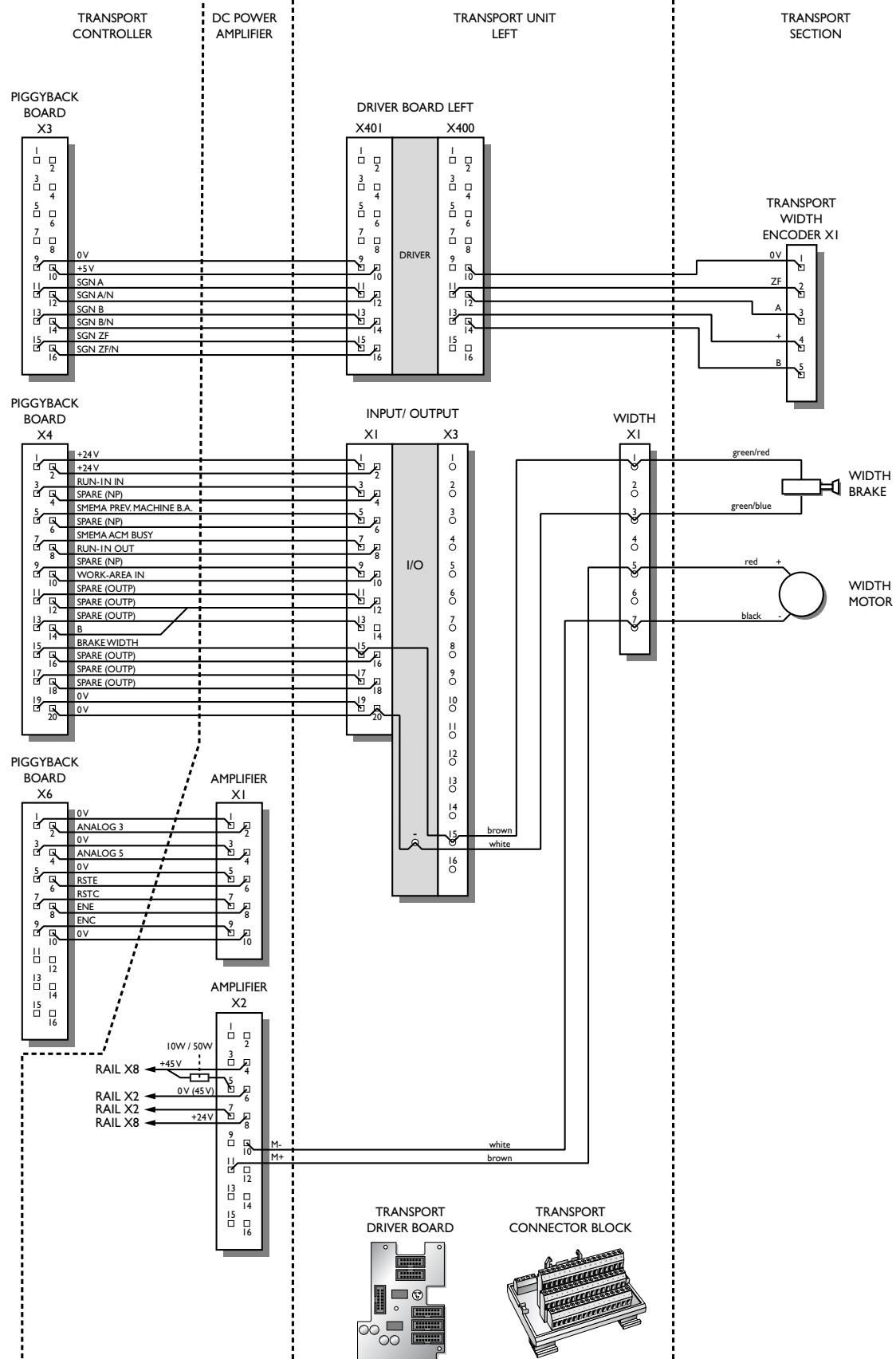


Figure 24 transport width motor, diagram

C5.4.3 Transport lift motor, diagram

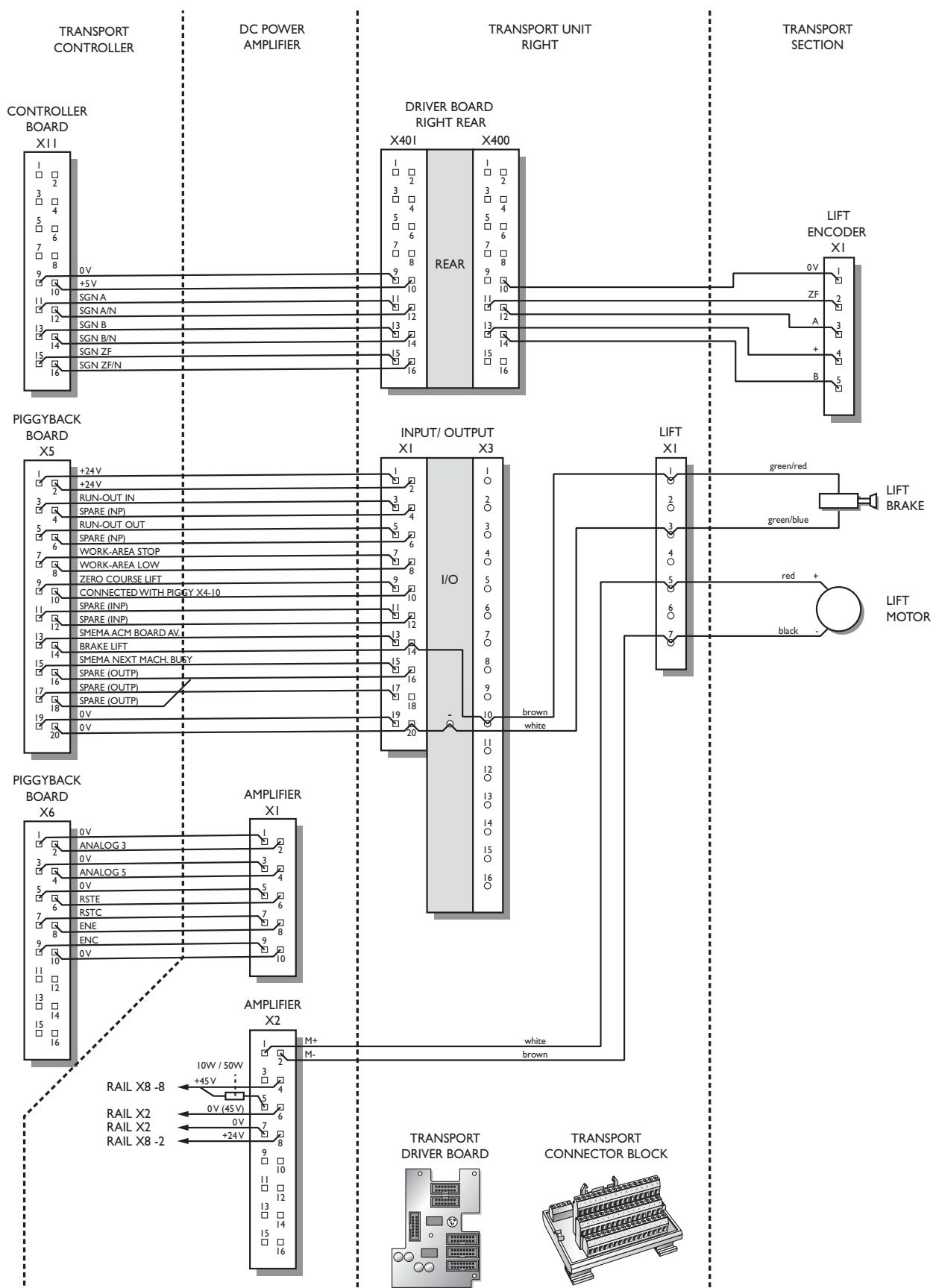


Figure 25 Transport lift motor, diagram

C5.4.4 Transport drive belt motors, diagram

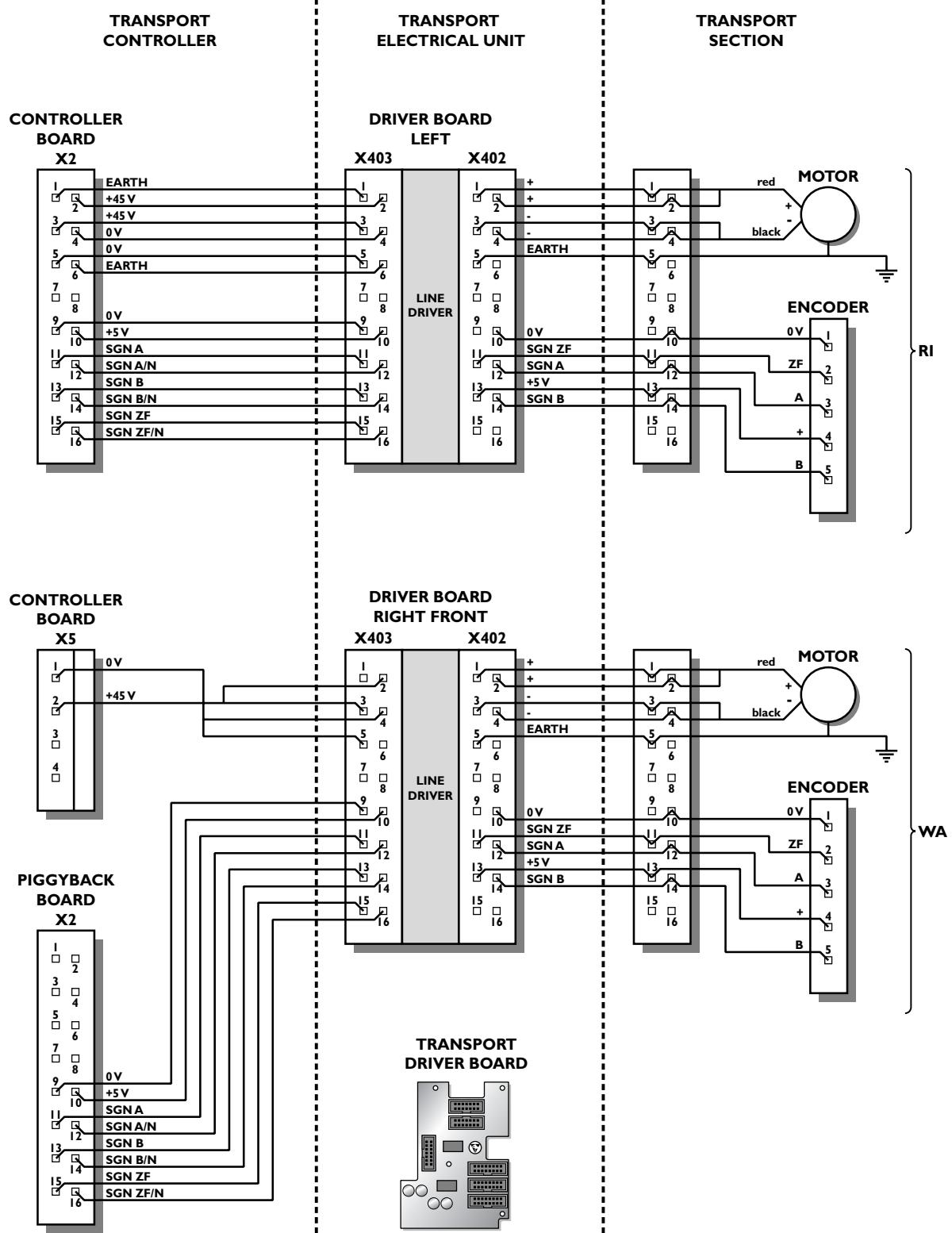


Figure 26 Transport drive belt motors, diagram

C5.4.5 Board sensors, diagram

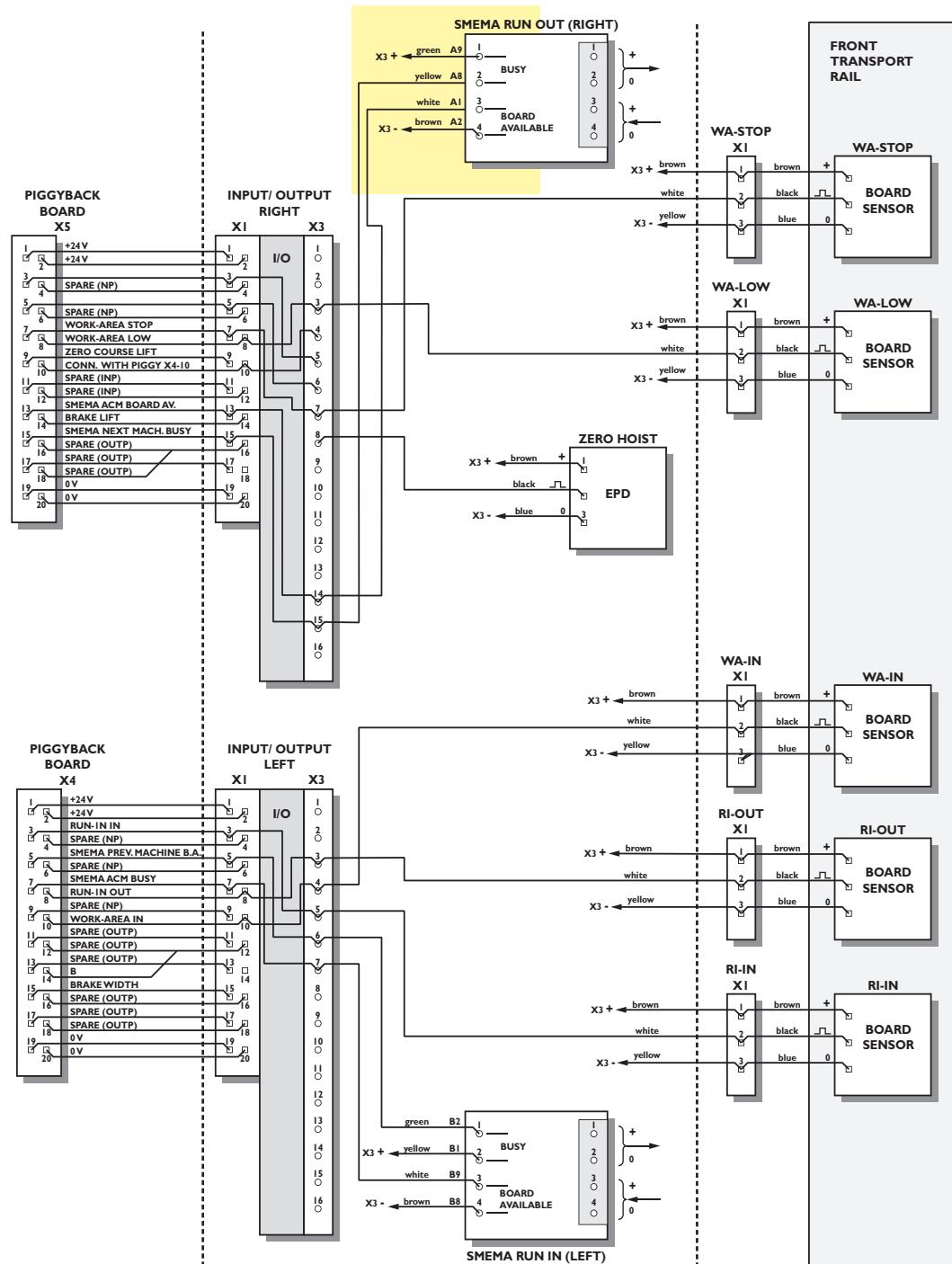


Figure 27 Board sensors, diagram

C5.4.6 Board transport, electrical diagram

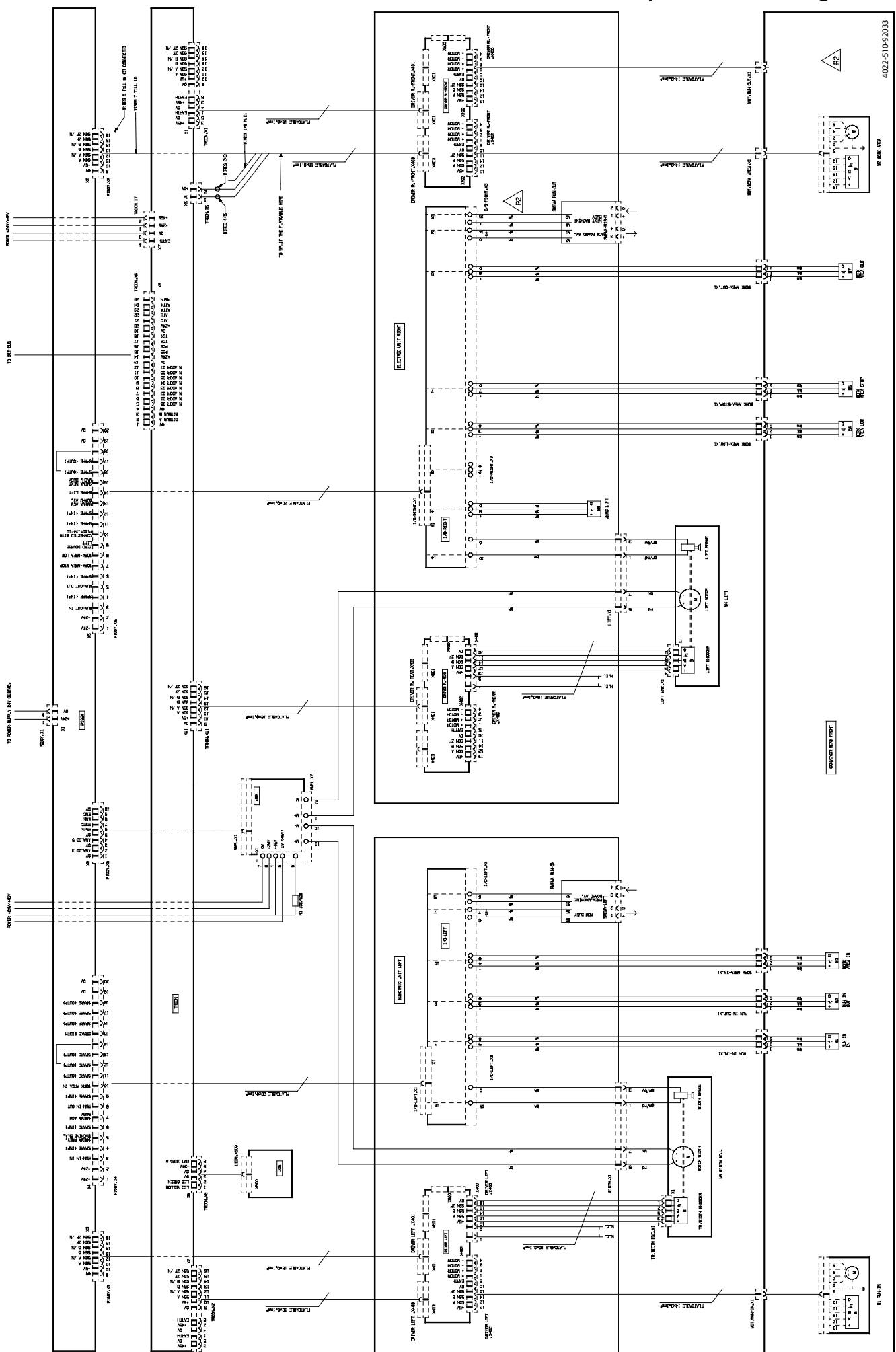


Figure 28 Board transport, electrical diagram

D5.3 Reference information

D5.3.1 Pneumatic controller, features

Pneumatic controllers exist in two technical versions, with two or three valves. For the AX-201 however, they are functional the same. This means that the clean valve is not supported.

D5.3.1.1 Pneumatic controller (3-valve), features

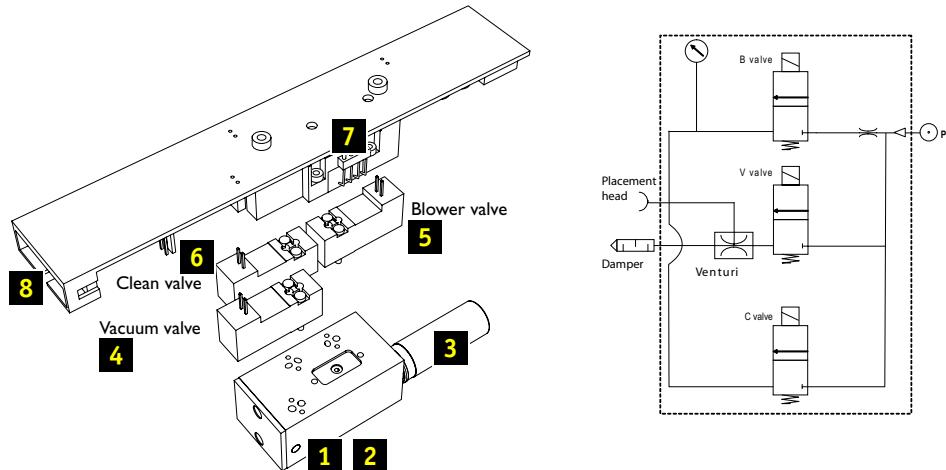


Figure 21 Pneumatic controller (3-valve), features

No.	Description
1	Air supply, 5-6 bar.
2	Outgoing vacuum / compressed air to toolbit.
3	Damper
4	Vacuum valve
5	Blower valve
6	Clean valve
7	Vacuum sensor
8	Connections, see D5.3.2.Production head DV controller, features Signals, see D5.3.3.Production head DV controller, signals on X1, X2

Figure 22 Pneumatic controller (3-valve), interfaces

D5.3.1.2 Pneumatic controller (2-valve), features

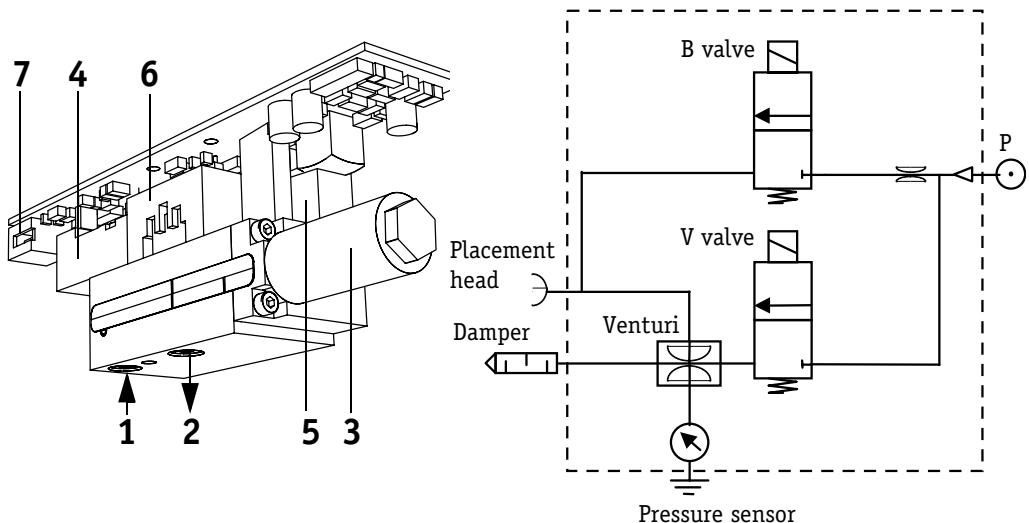


Figure 23 Pneumatic controller (2-valve), features

No.	Description
1	Air supply, 5-6 bar.
2	Outgoing vacuum / compressed air to toolbit.
3	Damper
4	Vacuum valve
5	Blow-off valve
6	Vacuum sensor
7	Connections, see D5.3.2.Production head DV controller, features Signals, see D5.3.3.Production head DV controller, signals on X1, X2

Figure 24 Pneumatic controller (2-valve), interfaces

D5.3.2 Placement head DV controller, features

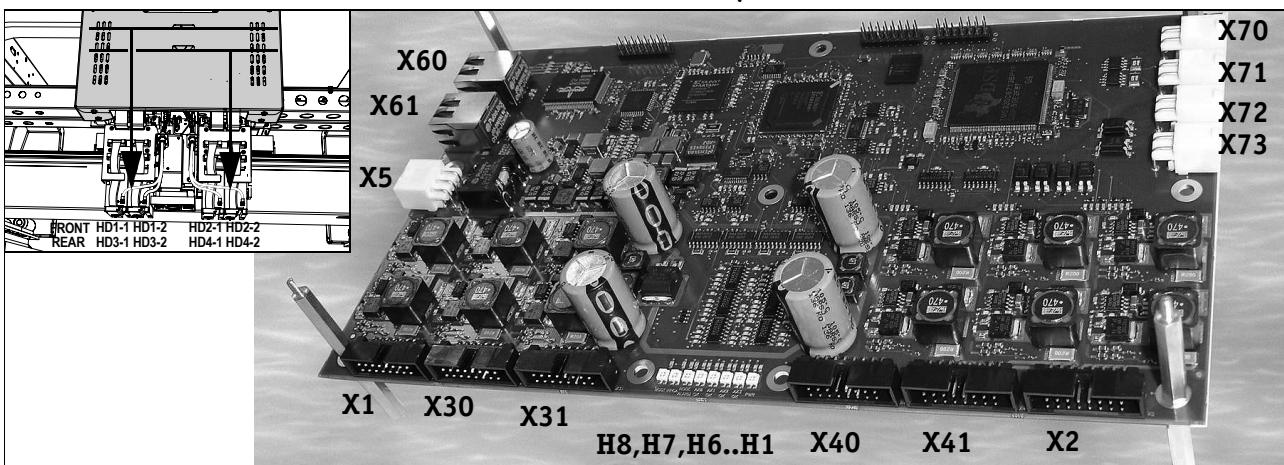


Figure 25 Placement head DV controller, features

LED	Function	Colour	Meaning
H1	Power	Off	No power / FPGA not configured
		Red	24V NOK
		Green	24V OK
H2	Axis 0 status HDx-1 head Z-direction	Off	Axis0 disabled
		Red	Axis0 fatal error
		Orange	Axis0 initializing
		Green	Axis0 enabled
		Green blinking	(together with other axis leds) Bootloader
H3	Axis 1 status HDx-1 head RZ-direction	Off	Axis1 disabled
		Red	Axis1 fatal error
		Orange	Axis1 initializing
		Green	Axis1 enabled
		Green blinking	(together with other axis leds) Bootloader
H4	Axis 2 status HDx-2 head Z-direction	Off	Axis2 disabled
		Red	Axis2 fatal error
		Orange	Axis2 initializing
		Green	Axis2 enabled
		Green blinking	(together with other axis leds) Bootloader
H5	Axis 3 status HDx-2 head RZ-direction	Off	Axis3 disabled
		Red	Axis3 fatal error
		Orange	Axis3 initializing
		Green	Axis3 enabled
		Green blinking	(together with other axis leds) Bootloader
H6	Node alarm	Off	No error
		Red	Synqnet error
H7	FPGA	Green	Network cyclic
		Green blinking	Network not cyclic
H8	Boot status	Green	Loaded runtime image into FPGA
		Dimmed	Loaded boot image into FPGA

Figure 26 Placement head DV controller, LED signalling

Connector	Function
X1	Pneumatic controller left
X2	Pneumatic controller right
X5	Power supply
X30	Placement head DV - Z left
X31	Placement head DV - RZ left
X40	Placement head DV - Z right
X41	Placement head DV - RZ right
X60	Synqnet input
X61	Synqnet output
X70	-
X71	Auxiliary I/O output, air valve of Z-lift cylinder
X72	Auxiliary I/O input, EPD of Z-lift
X73	-

Figure 27 Placement head DV controller, connections

D5.3.3 Placement head DV controller, signals

Pins	Description	Pins	Description
SQDRIVE1.X1, SQDRIVE2.X1 Pneumatic controller			
1	Digital output valve 1+	9	EARTH
2	Digital output valve 1-	10	Temperature sensor_A
3	Digital output valve 2+	11	Temperature sensor_B
4	Digital output valve 2-	12	Not connected
5	Digital output valve 3+	13	EARTH
6	Digital output valve 3-	14	Vacuum sensor on pneumatic controller_B
7	Reference	15	Vacuum sensor on pneumatic controller_A
8	Power supply +24V	16	Reference
SQDRIVE1.X5 SQDRIVE2.X5 Supply			
1	DC power 44V	4	DC power 24V
2	DC power return 44V	5	DC power return 24V
3	Shield	6	Shield
SQDRIVE1.X30 SQDRIVE1.X31 SQDRIVE1.X40 SQDRIVE1.X41 Placement head DVs			
SQDRIVE2.X30 SQDRIVE2.X31 SQDRIVE2.X40 SQDRIVE2.X41			
1	Motor phase R	9	Shield
2	Motor phase R	10	Digital switch input
3	Motor phase S	11	RZ motor A-
4	Motor phase S	12	RZ motor A+
5	Motor phase T	13	RZ motor B-
6	Motor phase T	14	RZ motor B+
7	Ground	15	RZ motor I-
8	Power supply +24V	16	RZ motor I+
SQDRIVE1.X71 SQDRIVE2.X71 Z-lift (air valve of Z-lift cylinder)			
1	Output +24V	3	-
2	digital output 0, -	4	-
SQDRIVE1.X72 SQDRIVE2.X72 Z-lift (EPD of Z-lift)			
1	Output +24V	3	Digital output +24V
2	-	4	Power return of+24V

Figure 28 Placement head DV controller, signals

D5.3.4 Placement head HA controller, features

This part is mounted in the control supply, see B5.3.1 Control supply, lay-out

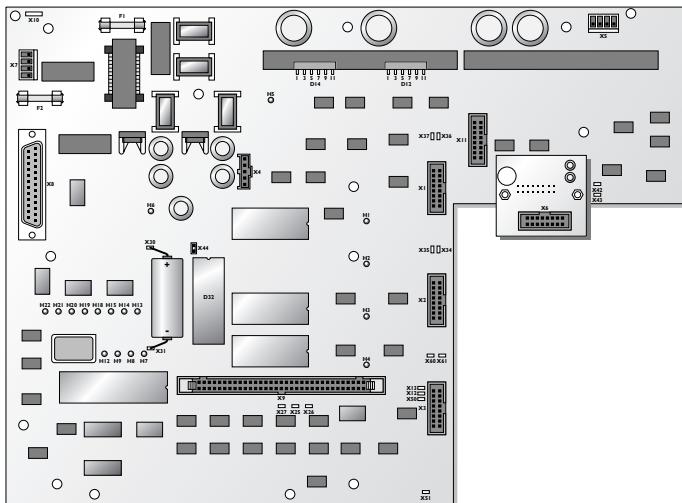


Figure 29 Placement head HA controller, LED signalling

LED	ON/OFF	SYSTEM STATUS
H3	ON	Zero fine Φ encoder
H4	ON	Zero fine Z encoder
H5	ON	24V supply < 16V (power failure)
H6	ON	45V supply > 25V (emergency stop)
H7	ON	Digital input - Φ EPD, zero coarse Z
H9	ON	Digital input - Enable controllers
H13	ON	Digital output - Select nozzle/grip
H14	ON	Digital output - Vacuum
H15	ON	Digital output - Exchange toolbit
H18	ON	Digital output - Select analogue
H19	ON	Digital output - PC busy
H21	ON	Digital output - Emergency head control
H22	ON	Digital output - Enable Φ amplifier

Figure 30 Placement head HA controller - LED status

IDENT	STATUS	SYSTEM FUNCTION
X1	Connector	Φ drive, zero EPD Z, Φ encoder error
X2	Connector	Z encoder
X3	Connector	Digital and analog I/O
X5	Connector	Z motor
X6	Connector	LEDs, Filter print
X7	Connector	Power input
X8	Connector	Bitbus communication
X10	Connector	Cabinet ground
X30	Test point	Battery +
X31	Test point	Battery -
X44	Jumper	Enable write EPROM (must be set)

IDENT	STATUS	SYSTEM FUNCTION
X51	Test point	Amplified vacuum reference/Hall sensor value
X60	Test point	Monitor out
X61	Test point	Monitor ground
F1	Fuse	45V/4A
F2	Fuse	24V/2A

Figure 31 Placement head HA controller, connections

D5.3.5 Manifold board for placement head HA

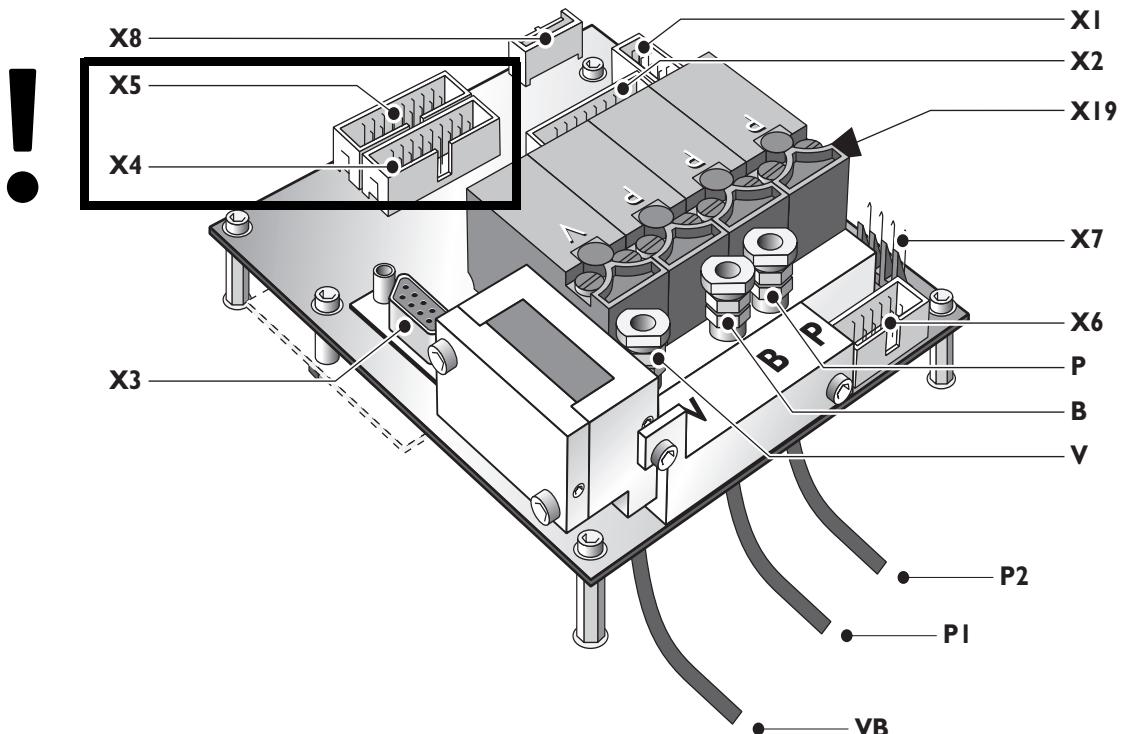


Figure 32 Manifold board



NOTE: Do not mix up connector X4 and X5.
A wrong connection will damage the Z encoder on the placement head HA.

D5.4 Pick and place, diagrams

D5.4.1 Placement heads HA-DV, air and vacuum supply

Complete diagram, see [B5.4.5 Air and vacuum, diagram](#)

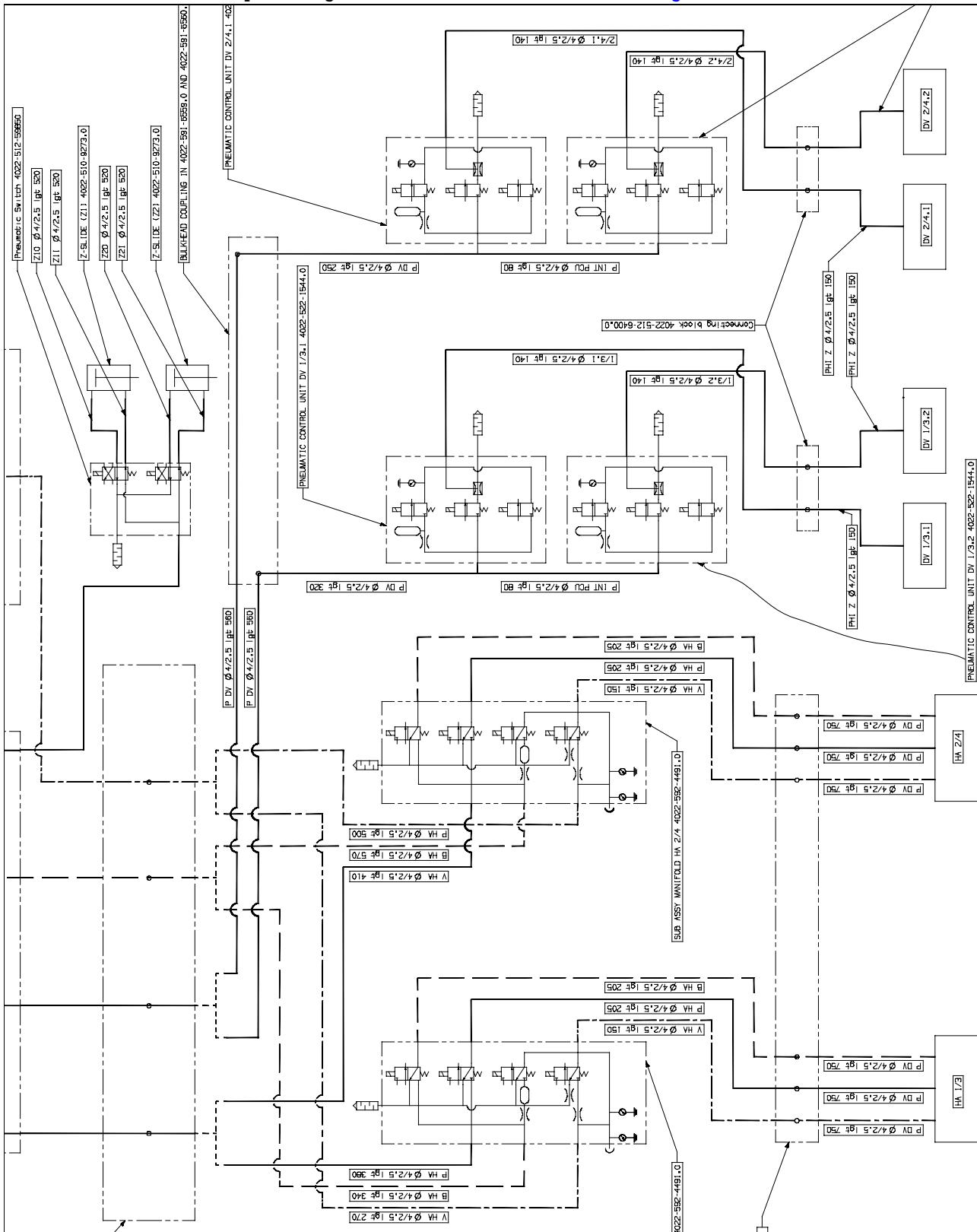


Figure 33 Placement heads, air and vacuum supply

D5-00005.fm

D5.4.2 Placement head HA, diagrams

D5.4.2.1 Manifold board, pneumatic diagram

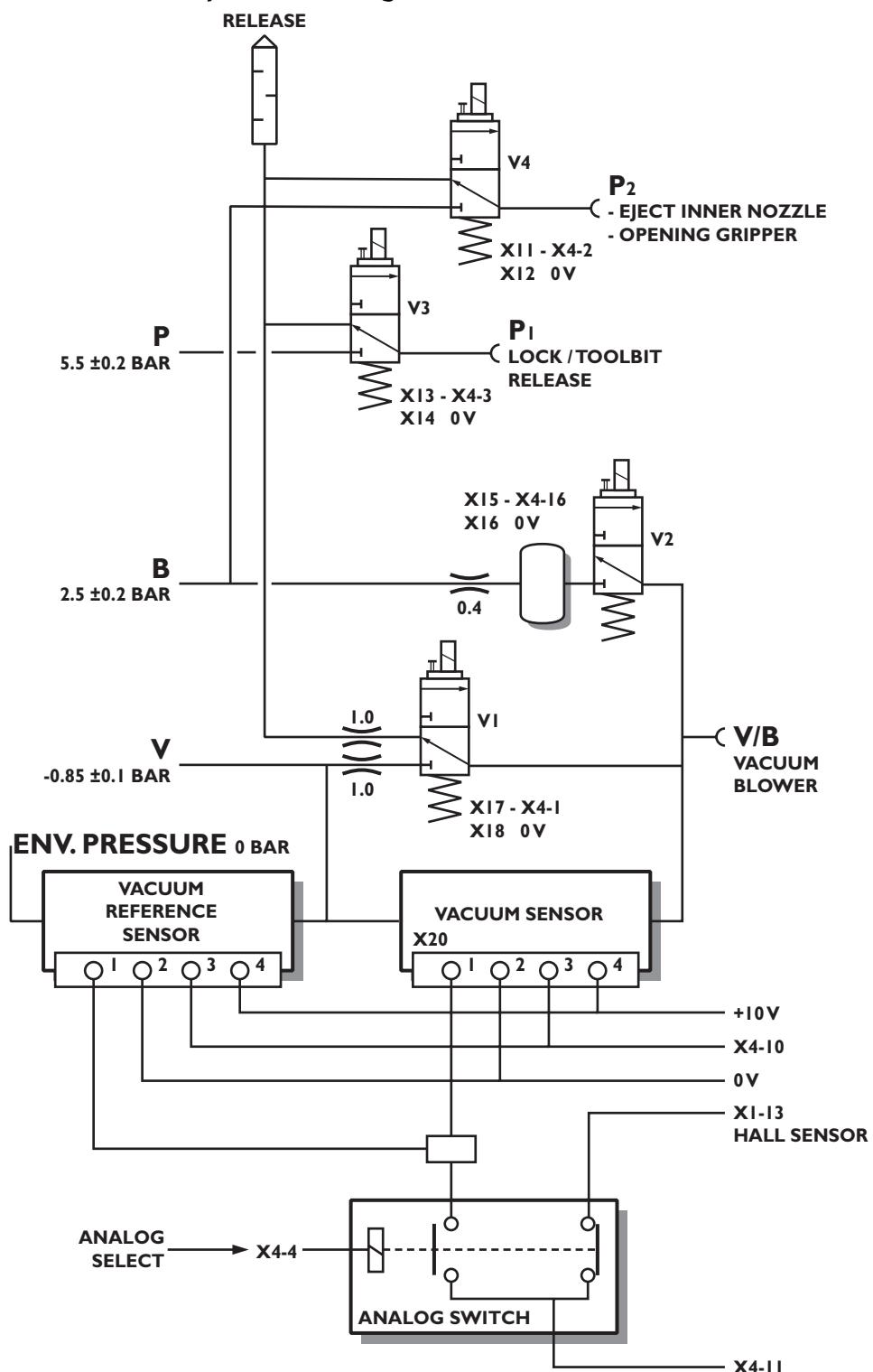


Figure 34 Manifold board, pneumatic diagram

D5.4.2.2 Placement head HA, controller X1, interconnection diagram

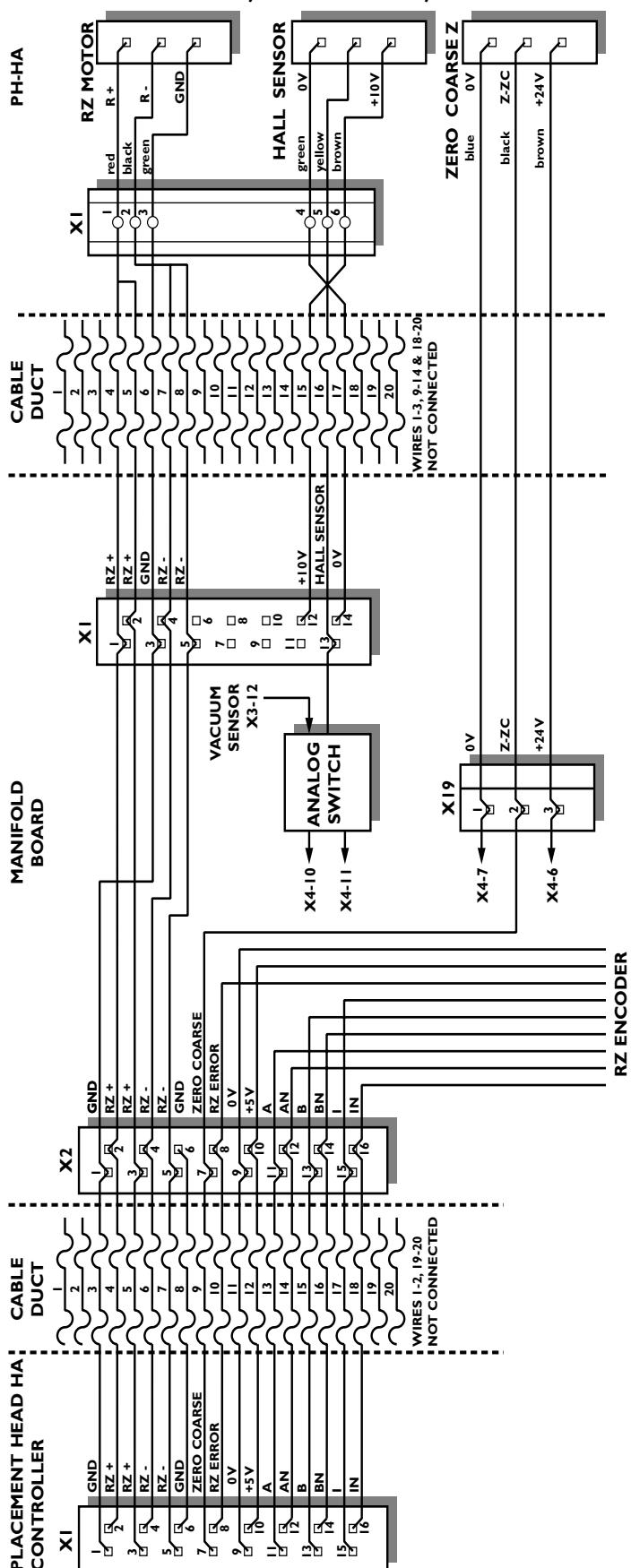


Figure 35 Placement head HA, controller X1, interconnection diagram

D5.4.2.3 Placement head HA, RZ encoder, interconnection diagram

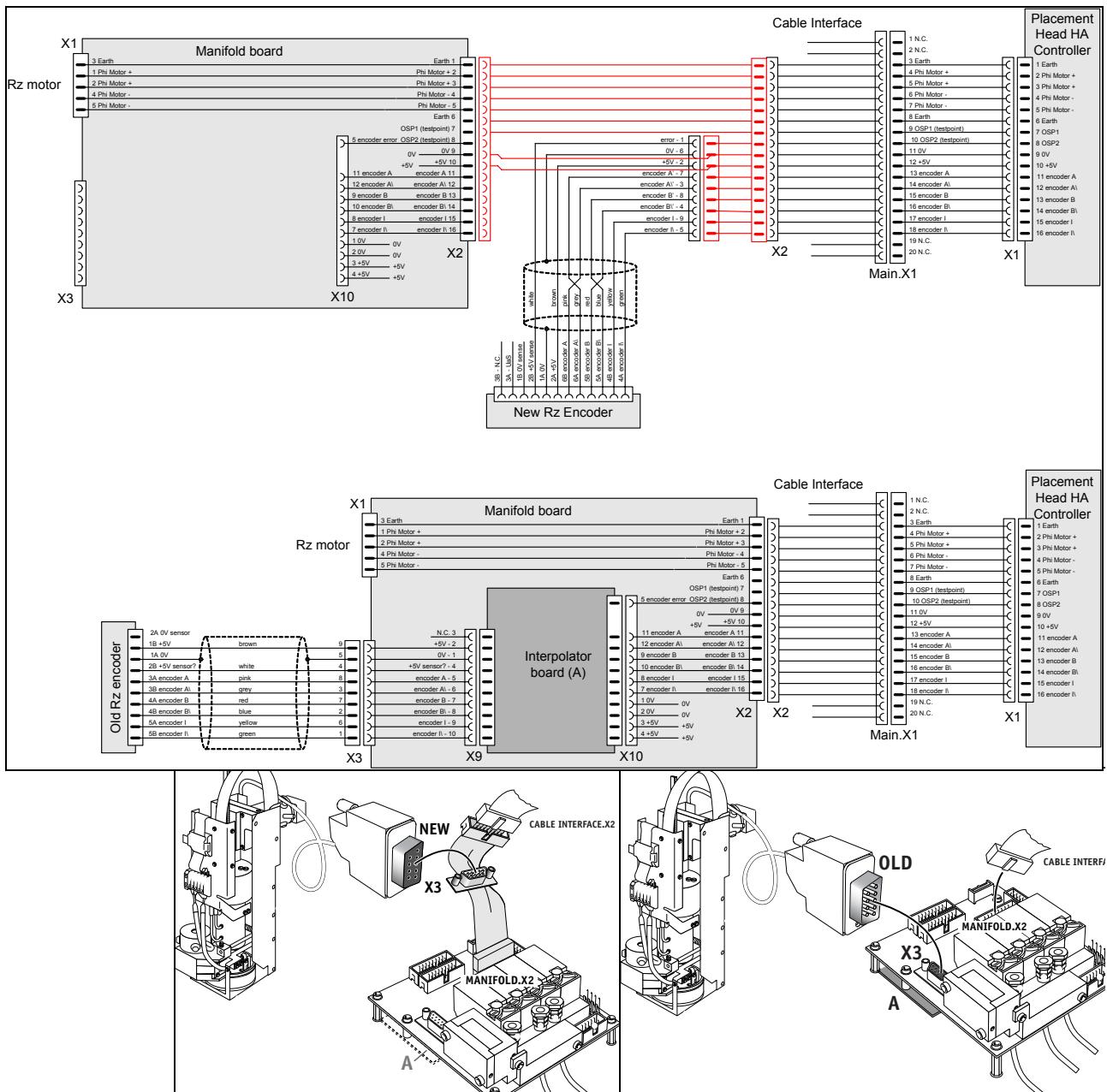


Figure 36 Placement head HA, RZ encoder, interconnection diagram

D5.4.2.4 Placement head HA, controller X3, interconnection diagram

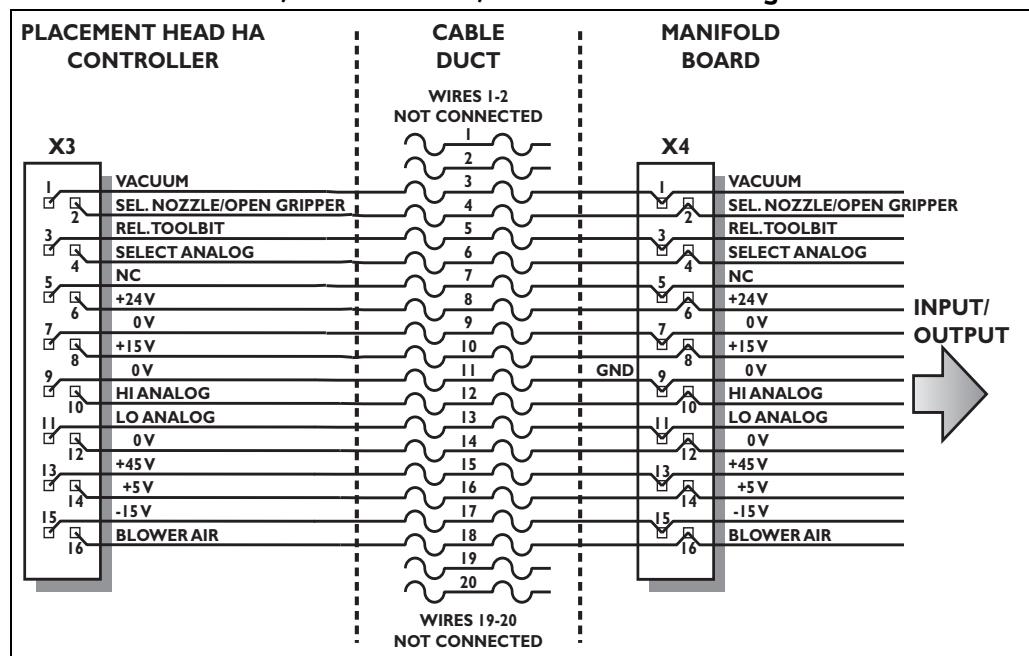


Figure 37 Placement head HA, controller X3, interconnection diagram

D5.4.2.5 Placement head HA, Z-motor interconnection diagram

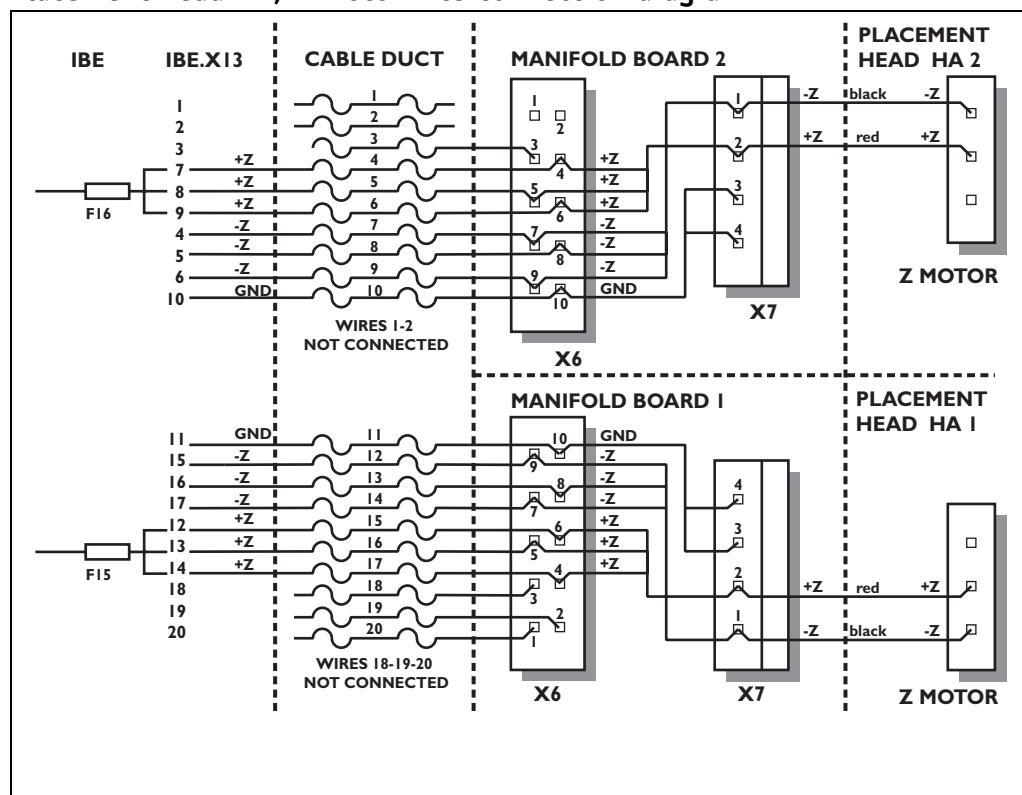


Figure 38 Placement head HA, Z-motor interconnection diagram

D5.4.2.6 Placement head HA, Z-encoder interconnection diagram

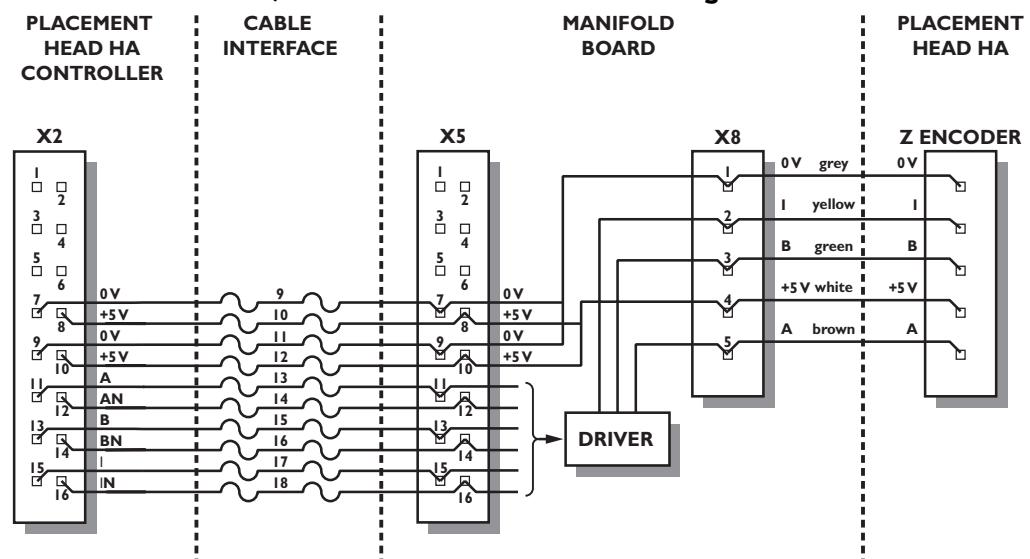


Figure 39 Placement head HA, Z-encoder interconnection diagram

D5.4.3 Placement head DV diagrams

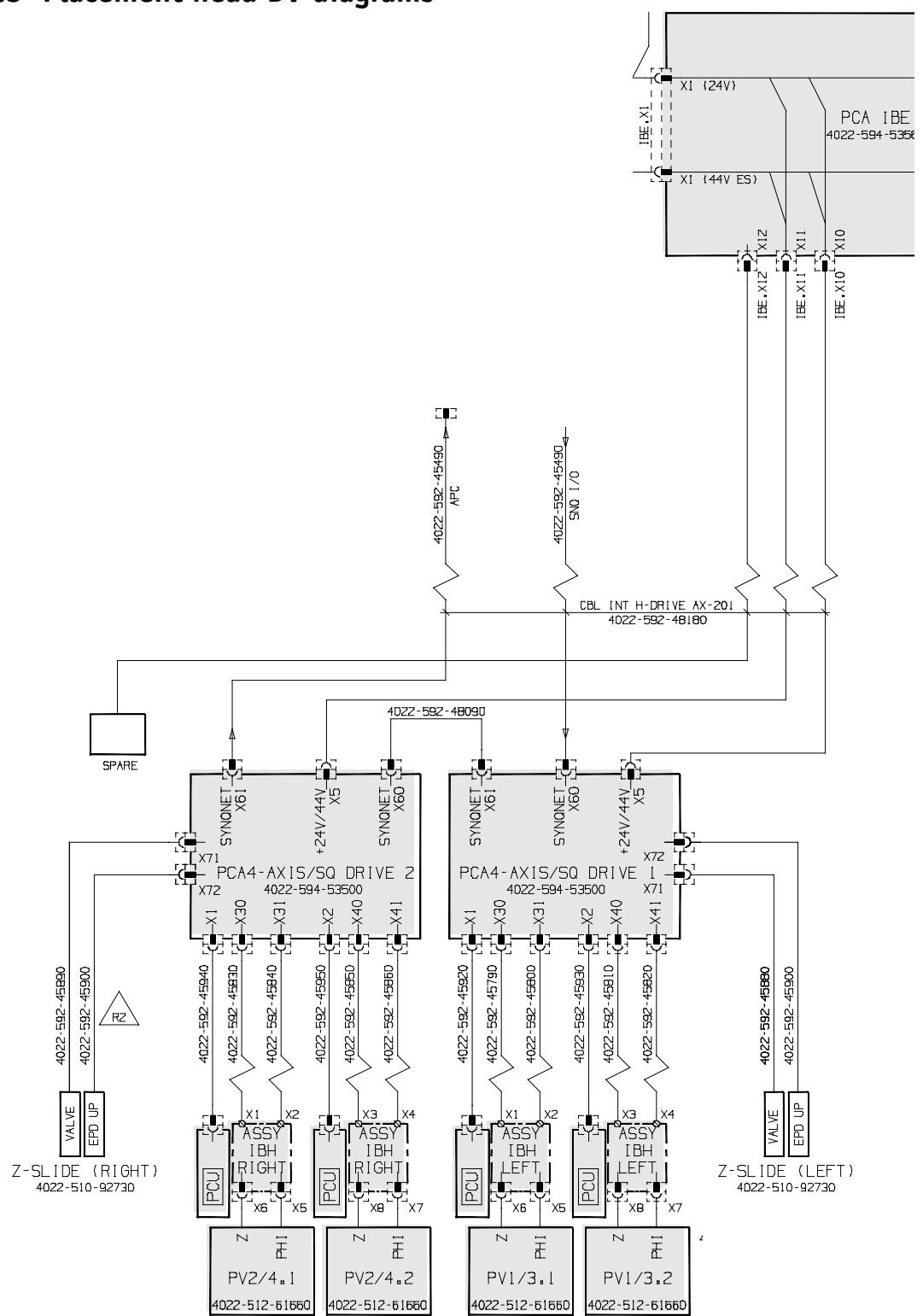


Figure 40 Placement head DV, diagram

Complete diagram, see A5.3.1.2.Wiring diagram PA2410/00

F5.4 Diagrams

F5.4.1 Vision diagram

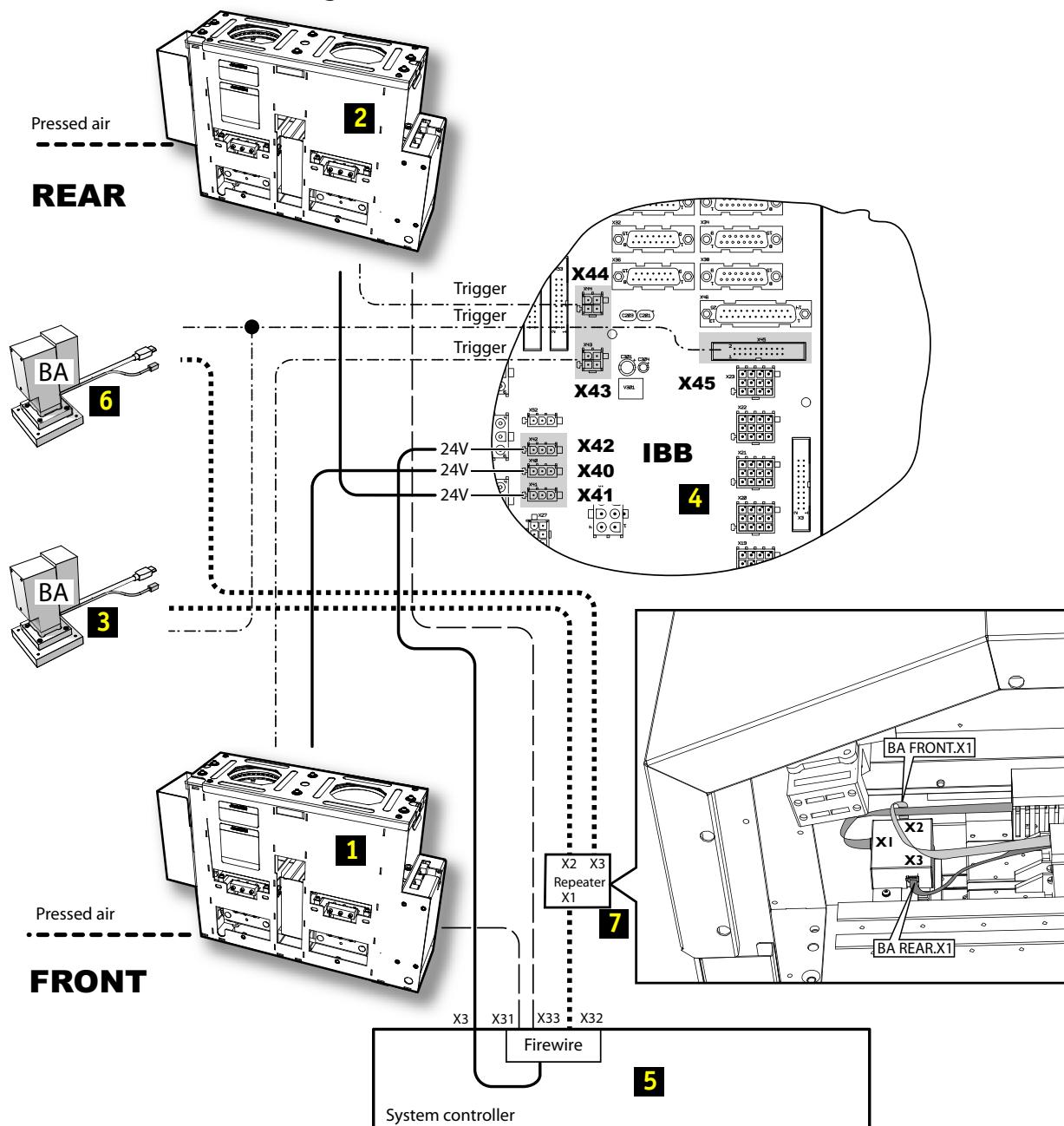


Figure 13 Vision diagram

1. CV camera, front
2. CV camera, rear
3. BA camera, front
4. Interconnection board base (IBB)
5. System controller
6. BA camera, rear
7. Repeater.

G5.3 Reference information

G5.3.1 XY controller, settings

Location of XY controller, see [B5.3.6 Process controller, slots](#)



Figure 8 XY controller

No setting applicable.

G5.3.2 Interconnection board drives (IBD), connections

This part is mounted in the control supply, see [B5.3.1 Control supply, lay-out](#)

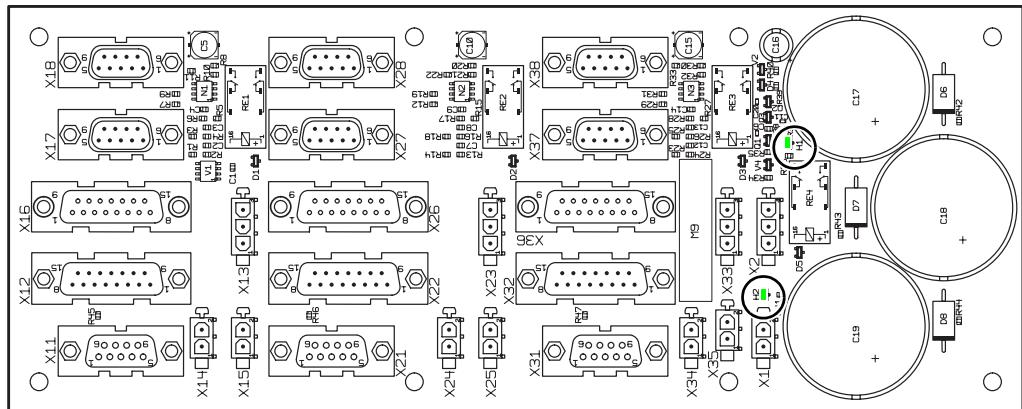


Figure 9 Interconnection board drives (IBD)

Connector			Description
X1			24V IN
X2			E-stop IN
X	Y1	Y2	
X11	X21	X31	External I/O from motion amplifier, servo
X12	X22	X32	C2 from motion amplifier (encoder in) servo
X13	X23	X33	C3 from motion amplifier (Enable)
X14	X24	X34	Logic supply from motion amplifier, servo
X15	X25	X35	Fan
X16	X26	X36	Encoder
X17	X27	X37	Motor PTC
X18	X28	X38	External PTC
LED signalling			Description
H1			Enabling circuit
H2			Power supply

Figure 10 Interconnection board drives (IBD)

G5.3.3 Interconnection board drives (IBD), signals

This part is mounted in the control supply, see [B5.3.1 Control supply, lay-out](#)

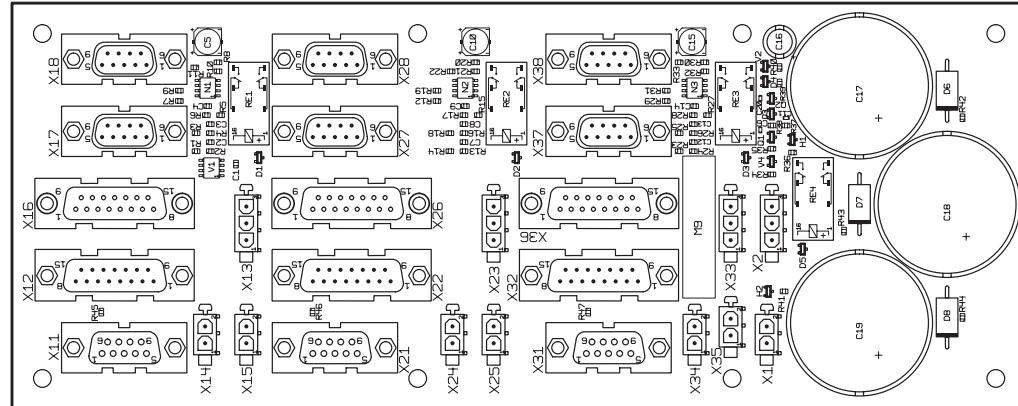


Figure 11 Interconnection board drives (IBD)

Pin	Description	Netname	Description	Netname	Description	Netname
X1 Supply in		X2, E-stop IN				
1	24V	24V	N.C.	N.C.		
2	0V	0V	0V	0V		
3	-	-	E-stop	E-stop		
X11, External I/O drive X		X21, External I/O drive Y1			X31, External I/O drive Y2	
1	Analog IN+	TEMP-X	Analog IN+	TEMP-Y1	Analog IN+	TEMP-Y2
2	AGND	0V	AGND	0V	AGND	0V
3	Analog IN-	0V	Analog IN-	0V	Analog IN-	0V
4	Common OUT2/OUT3	0V	Common OUT2/OUT3	0V	Common OUT2/OUT3	0V
5	OUT2	RELAY-X	OUT2	RELAY-Y1	OUT2	RELAY-Y2
6	IN4	Alarm-X	IN4	Alarm-Y1	IN4	Alarm-Y2
7	common IN4 to IN7	0V	common IN4 to IN7	0V	common IN4 to IN7	0V
8	OUT3.	FANS	N.C.	N.C.	N.C.	N.C.
9	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
X12, Encoder Drive X (to C2)		X22, Encoder Drive Y1 (to C2)			X32, Encoder Drive Y2 (to C2)	
1	5V encoder	5V-X	5V encoder	5V-Y1	5V encoder	5V-Y2
2	GND encoder	GND-X	GND encoder	GND-Y1	GND encoder	GND-Y2
3	A	ENCA-X	A	ENCA-Y1	A	ENCA-Y2
4	/A	ENC/A-X	/A	ENC/A-Y1	/A	ENC/A-Y2
5	B	ENCB-X	B	ENCB-Y1	B	ENCB-Y2
6	/B	ENC/B-X	/B	ENC/B-Y1	/B	ENC/B-Y2
7	I	ENCI-X	I	ENCI-Y1	I	ENCI-Y2
8	/I	ENC/I-X	/I	ENC/I-Y1	/I	ENC/I-Y2
9	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
10	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
11	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
12	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
13	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
14	thermostat High	PTC1-X	thermostat High	PTC1-Y1	thermostat High	PTC1-Y2
15	thermostat Low	PTC2-X	thermostat Low	PTC2-Y1	thermostat Low	PTC2-Y2
X13, Enable X (to C3)		X23, Enable Y1 (to C3)			X33, Enable Y2 (to C3)	
1	Enable	Enable	Enable	Enable	Enable	Enable
2	0V	0V	0V	0V	0V	0V
3	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
X14 Logic supply servo drive X		X24 Logic supply servo drive Y1			X34 Logic supply servo drive Y2	
1	24V	24V-X	24V	24V-Y1	24V	24V-Y2
2	0V	0V	0V	0V	0V	0V

Pin	Description	Netname	Description	Netname	Description	Netname
	X15 FAN X		X25 FAN Y1		X35 FAN Y2	
1	24V	24V-FANS	24V	24V-FANS	24V	24V-FANS
2	0V	0V	0V	0V	0V	0V
	X16 Encoder X		X26 Encoder Y1		X36 Encoder Y2	
1	5V encoder	5V-X	5V encoder	5V-Y1	5V encoder	5V-Y2
2	GND encoder	GND-X	GND encoder	GND-Y1	GND encoder	GND-Y2
3	A	ENCA-X	A	ENCA-Y1	A	ENCA-Y2
4	/A	ENC/A-X	/A	ENC/A-Y1	/A	ENC/A-Y2
5	B	ENCB-X	B	ENCB-Y1	B	ENCB-Y2
6	/B	ENC/B-X	/B	ENC/B-Y1	/B	ENC/B-Y2
7	I	ENCI-X	I	ENCI-Y1	I	ENCI-Y2
8	/I	ENC/I-X	/I	ENC/I-Y1	/I	ENC/I-Y2
9	Alarm encoder	Alarm-X	Alarm encoder	Alarm-Y1	Alarm encoder	Alarm-Y2
10	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
11	0V Fan	0V	0V Fan	0V	0V Fan	0V
12	24V Fan	24V-FANS	24V Fan	24V-FANS	24V Fan	24V-FANS
13	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
14	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
15	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
	X17 Motor PTC's X		X27 Motor PTC's Y1		X37 Motor PTC's Y2	
1	PTC1-X	PTC1-X	PTC1-Y1	PTC1-Y1	PTC1-Y2	PTC1-Y2
2	PTC2-X	PTC2-X	PTC2-Y1	PTC2-Y1	PTC2-Y2	PTC2-Y2
3	KTY1-X	KTY1-X	KTY1-Y1	KTY1-Y1	KTY1-Y2	KTY1-Y2
4	KTY2-X	0V	KTY2-Y1	0V	KTY2-Y2	0V
5	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
6	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
7	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
8	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
9	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
	X18 External PTC X		X28 External PTC Y1		X38 External PTC Y2	
1	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
2	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
3	EXT-KTY1-X	EXT-KTY1-X	EXT-KTY1-Y1	EXT-KTY1-Y1	EXT-KTY1-Y2	EXT-KTY1-Y2
4	EXT-KTY2-X	0V	EXT-KTY2-Y1	0V	EXT-KTY2-Y2	0V
5	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
6	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
7	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
8	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
9	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.

G5.3.4 Motion amplifier, connections

This part is mounted in the control supply, see [B5.3.1 Control supply, lay-out](#)

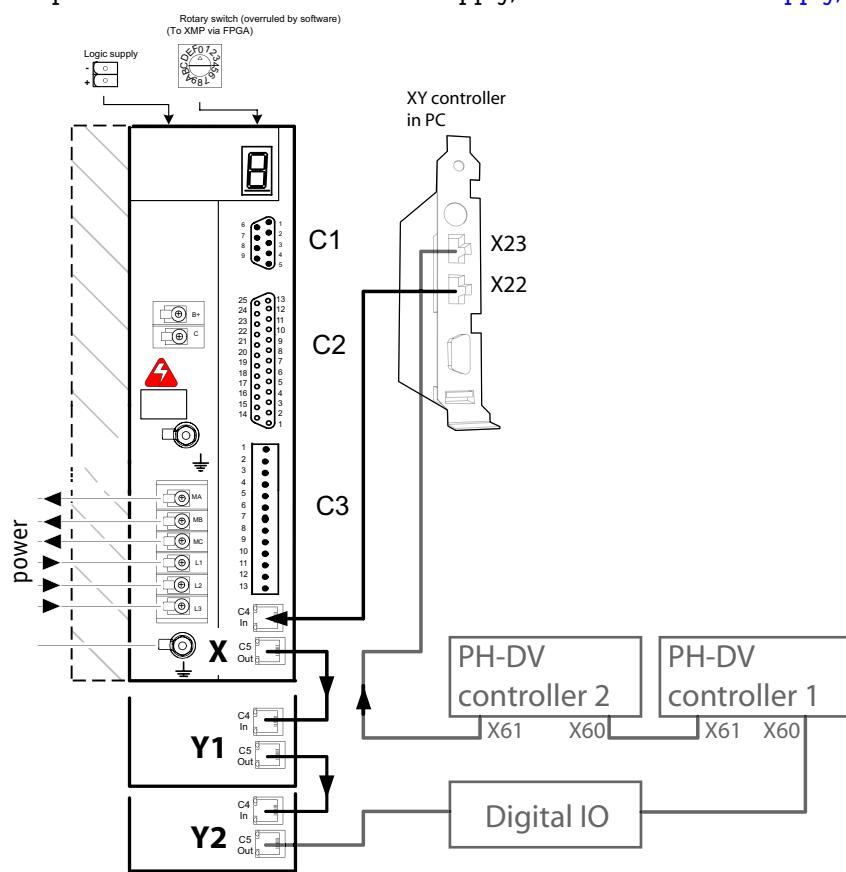


Figure 12 Motion amplifier, connections

Connections to motion amplifier, see [G5.4.1 XY robot, wiring diagram](#)

G5.3.5 Motion amplifier, LED signalling

LED	Description	Priority	LED	Description	Priority
	After logic power is applied, the LED will show a decimal point only. The drive is not operational at that point. A SynqNet RESET needs to be executed in order to bring the drive to an operational state.			EEPROM fault is a hardware failure and the drive must be returned for repairs.	7
	Torque Mode: the drive is configured and ready to be enabled.			Internal-failure of positive analog supply voltage is a hardware failure and the drive must be returned for repair.	8
	The decimal point is on when the drive is enabled. The XY robot must be initialised once at first start.			Internal-failure of negative analog supply voltage is a hardware failure and the drive must be returned for repair.	9
	This indicates that the drive is configured and ready to be enabled. The encoder initialization process will begin when the drive is enabled.			SynqNet communications fault. Check that the SynqNet cables are in place.	10
	Drive in Foldback (current limiting)			Encoder wire break 6	11
	Flash memory checksum failure (at power up). Need to re-configure the drive's parameters and SAVE them in the flash memory.	1		Illegal Halls, a state of either 000 or 111 was detected on the Halls signals.	12
	Over-current results from either a short circuit on the motor power, or by excessive current loop gain. This fault can only be cleared by cycling the power of the drive.	2		Index line break	13
	Over-voltage generally caused by regenerative voltage when decelerating the motor. Use a regen resistor to absorb the regen energy.	3		The commutation initialization process has failed. Read the WNSERR value (parameter 0x2F) to see what caused the failure.	14
	Drive over-temperature.	4		EnDat communications fault, check that the EnDat encoder is connected, or check the MENCTPYE parameter to verify that it is correctly set.	15
	Under-voltage, this fault will appear when the main AC power is not connected. It may also appear during high accelerations. If this is the case, consider programming UVMODE to ride through temporary voltage sags, and UVRECOVER to determine how the drive recovers from an under-voltage fault. Servo power disabled.	5		A/B out of range for a sine encoder and a resolver, the drive checks that $\sin^2 + \cos^2 = 1$, within tolerance. This fault indicates that the signal amplitudes are out of tolerance. This fault is not relevant for Encoder feedback.	16
	No comp; the drive is not configured. Load a configuration file and execute the CONFIG instruction.	6		Motor over-temperature – this fault may be triggered if the motor does not contain a temperature sensing device. If this is the case, set THERMOPDE to 1, which will tell the drive to ignore this fault.	17
	Watchdog: drive firmware failure.			Internal failure of positive and negative analog supply voltages.	

Figure 13

G5.3.6 Encoders on XY robot, LED signalling

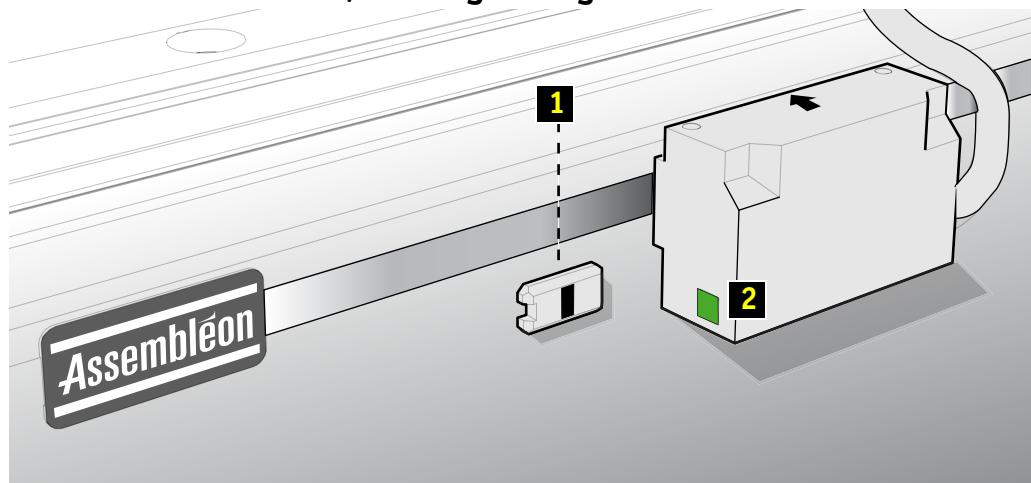


Figure 14 Encoder on XY robot

Encoder position	LED (2)
As shown in picture	Green
At reference marker (1)	Green, when passing the LED flashes red for 0.25 sec.

Figure 15 LED signalling encoder

G5.4 Diagrams

G5.4.1 XY robot, wiring diagram

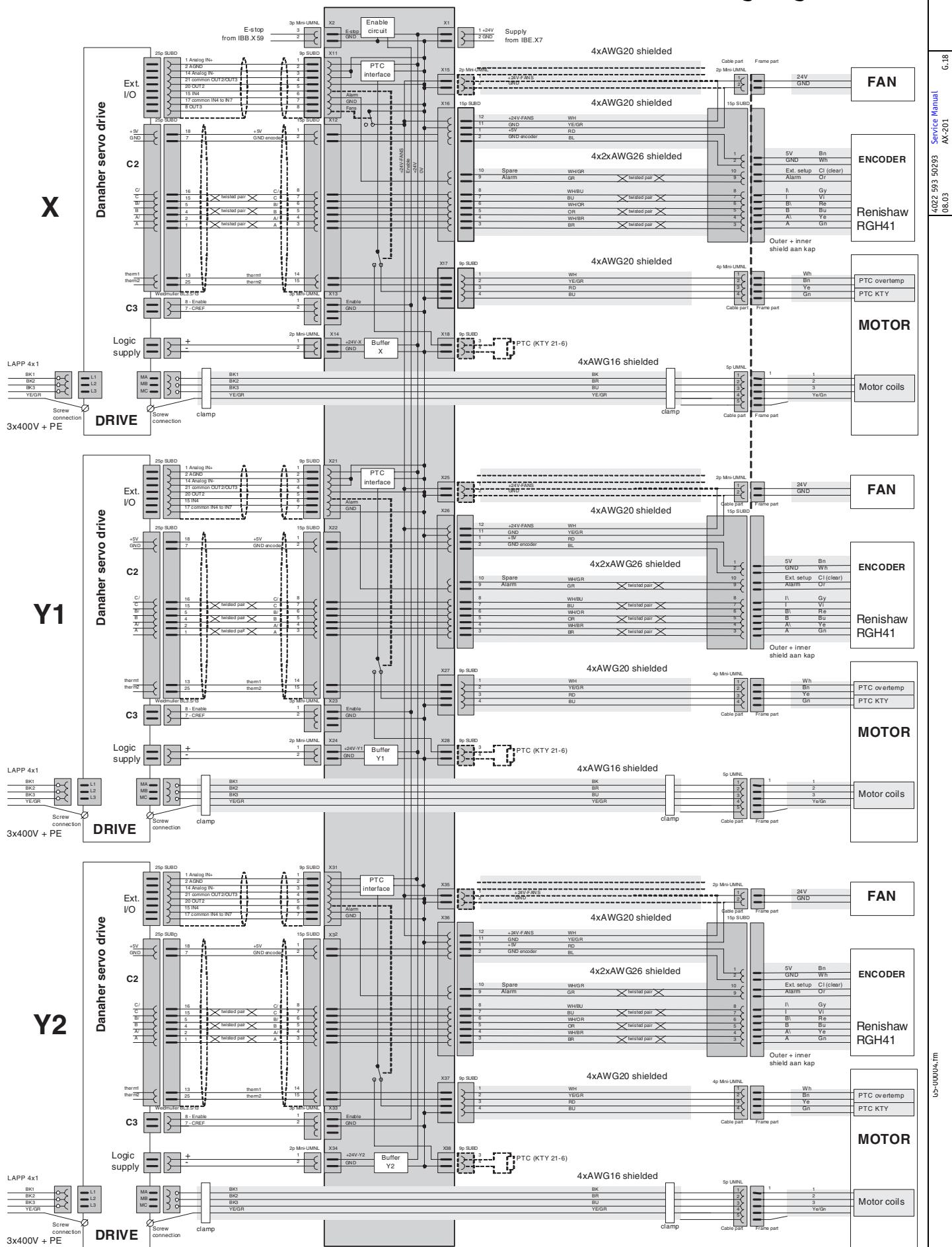


Figure 16 XY-robot, wiring diagram